United States Department of Agriculture
Forest Service

East Face Vegetation Management Project

Environmental Assessment

La Grande Ranger District, Wallowa-Whitman National Forest, Union and Baker Counties, Oregon

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Introduction

Due to an existing strong collaborative relationship between the Forest Service (FS), Oregon Department of Forestry, and Natural Resources Conservation Services, it became apparent that the East Face project provided a tremendous opportunity to apply compatible vegetation and fuels management treatments on federal, adjacent private lands and Oregon Department of Fish and Wildlife lands. The East Face Vegetation Management project area in combination with adjacent BLM, State, and private lands became a pilot project for the National Cohesive Wildfire Strategy (CWS) offering opportunities to apply the "all hands, all lands" principles and implement efforts to move the area towards the goals of the CWS. This analysis deals solely with activities on FS and BLM lands; however, treatments proposed in this project area have been coordinated with the fuel reduction and vegetation management activities occurring or planned to occur on adjacent private and state lands.

Cohesive Wildfire Strategy

In response to requirements of the Federal Land Assistance, Management, and Enhancement (FLAME) Act of 2009, the Wildland Fire Leadership Council (WFLC) directed the development of the National Cohesive Wildland Fire Management Strategy.

The CWS is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues.

Three primary factors have been identified as presenting the greatest challenges and the greatest opportunities for making a positive difference in addressing complex wildfire issues. They are:

- ***Restoring and maintaining resilient landscapes.*** The strategy must recognize the current lack of ecosystem health and variability of this issue from geographic area to geographic area. Because landscape conditions and needs vary depending on local climate and fuel conditions, among other elements, the strategy will address landscapes on a regional and sub-regional scale.

- ***Creating fire-adapted communities.*** The strategy will offer options and opportunities to engage communities and work with them to become more resistant to wildfire threats.

- ***Responding to Wildfires***. This element considers the full spectrum of fire management activities and recognizes the differences in missions among local, state, tribal and Federal agencies. The strategy offers collaboratively developed methodologies to move forward.

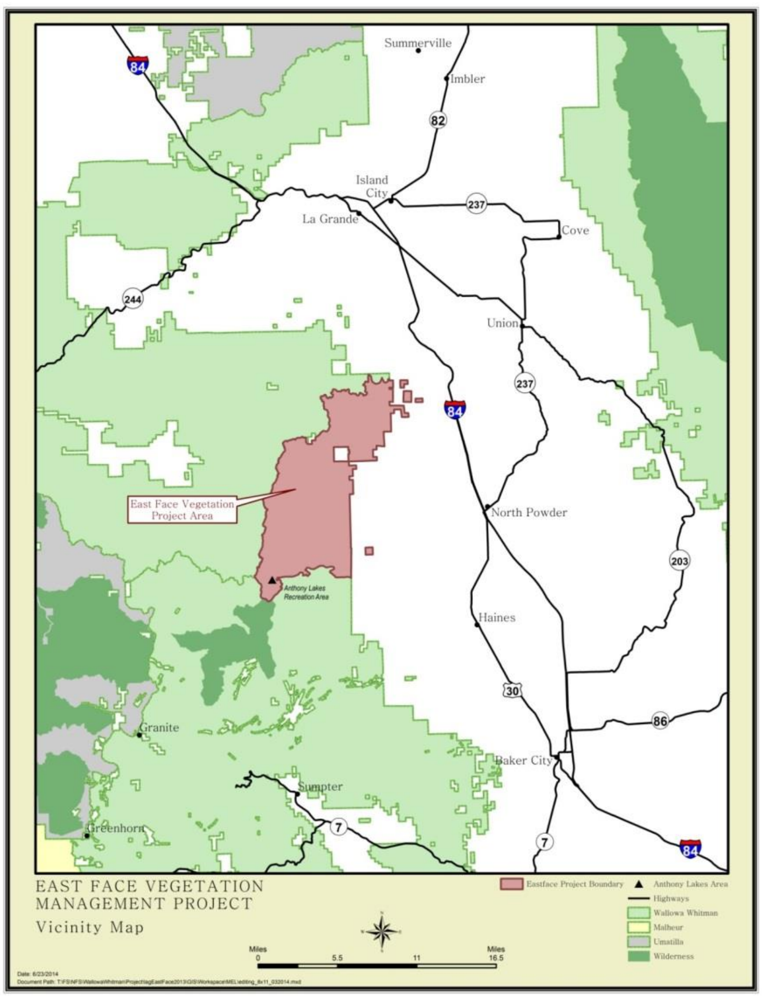
We are proposing to reduce surface fuel loadings, ladder fuels, and canopy bulk densities in strategic locations throughout the East Face Vegetation Management project area. Strategic locations are along key roads within the project area, ridgetops, private land interface areas, around private structures in the Floodwater Flats area, and the Anthony Lakes Recreation Area. Numerous strategies for creating fuel reduction areas would be employed within the 47,621 acre project area. These actions are proposed to be implemented on 46,397 acres on the La Grande and Whitman Ranger Districts of the Wallowa-Whitman National Forest and 1,224 acres of Vale Bureau of Land Management (BLM) lands.

We prepared this environmental assessment (EA) to determine whether implementation of the fuel reduction activities within the project area may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement. By preparing this EA, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA). For more details of the proposed action, see the Proposed Action and Alternatives section of this document.

Proposed Project Location

The 47,621 acre East Face project area encompasses all or portions of the Upper Wolf Creek subwatershed of the Wolf Creek-Powder River watershed and the Anthony Creek and portions of Antone Creek drainages in the North Powder River watershed located approximately 12 miles west of the town of North Powder, Oregon. The project area is located south of the City of La Grande Municipal watershed, north of the North Fork John Day Wilderness, and west of the Oregon Department of Fish and Wildlife (ODFW) Elkhorn Wildlife Area. The planning area straddles two counties (Baker and Union), includes 1,224 acres of BLM lands, encompasses portions of 3 different wildland urban interface areas (WUI's) and includes over 20 miles of shared boundary with private, state and Bureau of Land Management forest and range lands. Within these WUI areas there are numerous buildings and residences along with industrial and non-industrial private forest and range lands. In addition, the planning area encompasses the highly used Anthony Lakes recreation area which includes ski resort facilities, numerous campgrounds, recreational trails and recreation residences. The project area is located at Townships 5, 6 and 7 South, Ranges 36, 37, and 38 East. Refer to Figure 1 – East Face Project Vicinity Map.

Figure 1 - Vicinity map



Forest Plan Management Direction

This environmental assessment is tiered to the Final Environmental Impact Statement (FEIS) for the Wallowa-Whitman National Forest Land and Resource Management Plan, as amended. Major Plan amendments relevant to this project include:

> *EA on Continuation of the Interim Management Direction Establishing Riparian, Ecosystem, and wildlife Standards for Timber Sales, as signed on May 20, 1994,* which provides additional standards and guidelines (USDA, 1994, and commonly known as the Screens);
>
> *Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California*, as signed in 1995, which provides additional standards and guidelines (USDA, 1995, and commonly known as PACFISH). Refer to guidelines described on page 42 of the EA for specific PACFISH direction.

The Forest Plan, as amended, includes management goals and objectives and standards and guidelines, both forest-wide and specific to land allocations. All proposed activities in this project are consistent with the management guidance and direction provided in the Forest Plan.

The project area is allocated under the Wallowa-Whitman National Forest Plan Forest and its Environmental Impact Statements (as amended) to the following management areas. All applicable management direction specific to the following management areas apply to this project area (refer to Management Direction Map in Appendix F):

MA1 – (35,146 acres). Emphasizes wood fiber production on suitable timberlands while providing relatively high levels of forage and recreational opportunities.

MA3/3A – (4,681 acres). These management areas provide a broad array of forest uses and outputs with emphasis on timber production. However, timber management is designed to provide near-optimum cover and forage conditions on big game winter (MA3- 995 acres) and selected summer ranges (MA3A- 3,686 acres).

MA6 – (2,600 acres). Management emphasizes opportunities for those dispersed recreation activities involving combinations of viewing scenery, hunting, fishing, rock hunting, observing wildlife, snowshoeing and cross-country skiing, camping, hiking, and backpacking. These areas are to remain relatively natural and undeveloped with road densities similar to 1985 levels. Timber harvest may occur in the event of a catastrophe or when analysis shows timber removal to be necessary to prevent the spread of insects onto adjacent lands.

MA15 – (2,905 acres). These areas are intended to maintain habitat diversity, preserve aesthetic values, and to provide old growth habitat for wildlife. Evidence of human activities may be present but does not significantly alter the other characteristics and would be a subordinate factor in a description of such a stand.

MA16 – (1,171 acres). These areas include sites such as work centers, fire lookouts, permitted ranch headquarters, campgrounds, seed orchards, and other areas which are occupied by facilities for administration, public recreation, summer home tracts, ski areas, or features of cultural significance. Timber harvest may occur to facilitate recreational, administrative, or other uses or for safety reasons.

BLM Management Direction

The 1989 Baker Resource Management Plan and Record of Decision (RMP/ROD) provides management direction for each resource value over the Baker Resource Area as a whole, and then in a site specific way for each resource by geographic unit. The purpose and need for action is consistent with the Baker RMP/ROD management direction for Riparian Area Management, Wildlife and Fisheries Habitat, Soil, Water, and Air, Forest Management, and Fire Management. Management direction provided in the RMP/ROD that supports fuels management and ecological restoration activities in the Project Area are outlined in this section. Specific project objectives that address RMP/ROD management direction by moving toward a desired condition are as follows:

- **Riparian Area Management** – Management actions within riparian areas would include measures to protect or restore natural function.
- **Wildlife and Fisheries Habitat** – Primary emphasis will be to ensure availability of palatable shrubs and thermal cover for deer on crucial winter ranges in Baker County.
- **Soil, Water, and Air –** Soils will be managed to maintain productivity and minimize erosion. Watersheds where there is a potential for improvement or further degradation will be intensively managed to improve soil, water, and air resources.
- **Forest Management –** Precommercial thinning and other cultural practices will be performed to maintain the allowable cut and to benefit other resources, particularly wildlife and watershed values.
- **Fire Management –** Prescribed fire, planned or unplanned ignitions, will be used to meet other resource objectives such as increase habitat diversity, reduce fuel loads, control unwanted vegetation, and reintroduce fire into a natural role.

Need for the Proposal

The purpose and need for action describes what the desired condition is for the East Face area and how the existing condition does not meet that desired condition answering the question "why here, why now?"

Desired Future Condition

Forest Structure - The structural arrangement of vegetation, both vertical and horizontal and the size and arrangement of trees, grasses, and shrubs is important for wildlife habitat, controlling insect predation and disease and wildfire hazards, scenic integrity, and potential social and economic products. The range of these structures on the landscape should represent the full spectrum from young to old stands. Desired forested structural stage distribution and abundance within the project area should create conditions that are ecologically resilient, sustainable, and compatible while maintaining natural disturbance processes such as fire. The range of desired structural conditions should be based on the best available science and meet the needs of the species dependent on each structural stage and allow for variations in the mix of structural stage combinations across the landscape to respond to potential changes in climate over time.

Fire Behavior - The desired condition within the project area is for fire (both planned and wildfire) to play a role in creating ecologically resilient forest and rangeland conditions. Fire regimes are characterized by the frequency cycle for fire within a particular vegetation type. It is desired that fire regimes return to within or near to their historical range of frequencies (in years) within the project area and exhibit fire behavior, effects and other associated disturbances similar to those that occurred prior to fire exclusion (suppression) reducing the risk of loss of key ecosystem components. Within wildland urban interface (WUI) and defensible fuel profile zone (DFPZ) areas activities are based on wildfire protection objectives, which may over-ride ecological desired conditions. Vegetative structures would result in fire intensity that allows for safe and effective suppression actions within WUIs and DFPZs. Fire risk within WUIs and DFPZs would be managed so as not to limit the ability to use fire for resource restoration in areas adjacent to WUIs.

Whitebark Pine - The desired condition for whitebark pine is: No net loss of habitat for them within the project area; genetic diversity is conserved across the landscape; and degraded habitat and connectivity are restored wherever necessary. The expected results are: Populations will exhibit increased age class diversity and the risk of mortality from mountain pine beetle and stand-replacing fire is reduced and resistance to white pine blister rust is increased.

Big Game Habitat - The desired condition for forested areas supporting elk and deer herds is to maintain a mosaic of forage and security areas within the project area. Adequate forage areas close to cover and far from roads and trails open to motor vehicle use is available on spring, summer and fall habitat for these species. In areas where elk and deer have the potential to damage adjacent private lands or there is a need to meet other management goals across mixed land ownerships, the quantity of forage and cover areas may be reduced such as in WUIs where forage and cover may not be optimal.

Landscape Connectivity - Landscape patterns can influence disturbance processes, nutrient cycling, and plant and animal distribution. These patterns are dynamic and are influenced by natural and human-induced disturbances. The desired condition for landscape patterns is to have them be spatially and temporally diverse creating a positive influence on overall ecological functions, scenic values, and providing for connectivity by allowing animals to move across landscapes.

Economics - Management of national forests contributes to outputs and opportunities that support community infrastructure. National forests foster healthy and resilient communities and American Indian tribes by providing sustainable ecological services and products. Lands classified as suitable for timber production has a regularly scheduled timber harvest program that provides social and economic benefits while contributing to ecosystem health and sustainability. These lands also provide other forest products such as berries and mushrooms available for gathering in sustainable amounts for general public, commercial, and tribal use. Outdoor recreation opportunities would also be maintained within the project area to enrich the lifestyles and mental and physical condition of national forest visitors.

Watershed and Aquatic Habitat - The desired condition for watersheds and aquatic habitat in the area is to promote processes that control the routing of water, sediment, wood, and organic materials at levels which result in self-sustaining riparian and aquatic ecosystems. In-stream flows are sufficient to create and sustain riparian, aquatic, and wetland habitats. Drainage network connections provide chemically and physically unobstructed routes to areas critical for meeting the life history requirements of aquatic, riparian-dependent, and many upland species of plants and animals. Habitat elements (including spawning and rearing habitat, water quality, connectivity, etc.) are in functional condition and sufficiently distributed to support self-sustaining populations of native fish. Native fish species have access to historically occupied aquatic habitats and connectivity between habitats allows for the interaction of local populations.

Social – Social well-being contributes to national forest resilience by fostering public use patterns and restoration strategies that support human communities, livelihoods, cultures, and social values. National forests contribute to community resilience by providing jobs, ecosystem services, scenery, and recreational opportunities. Each individual's ties to the land, traditional cultures, and communities help characterize social well-being.

Existing Condition

Forest Structure - The planning area includes 3 primary forest vegetation types including cold upland, moist upland and dry upland forest communities. The planning area reflects forest conditions shaped by past large wildfires, fire suppression and forest management activities. Past wildfires (Anthony Burn, Tanner Gulch) have resulted in large patches of lodgepole pine dominated stand conditions. Suppression of wildfire has allowed stands historically characterized by more open grown widely spaced fire tolerant trees (such as ponderosa pine and western larch) to develop dense, multi-layer stand conditions with increased amounts of less fire tolerant trees such as grand fir. Past forest management included even aged regeneration harvests resulting in reduced levels of larger diameter trees, increased amounts of smaller understory trees and areas of fragmented forest patches.

An assessment of the current range of forest structures compared to the natural range indicate excess levels understory re-initiation structures ("middle aged" forests – understory reinitiation (UR)) and severely under-represented levels of more open large tree dominated older forest structures (Old Forest Single Story - OFSS) across all forest types. Within the cool moist forest types, younger forest stand initiation structures (SI) and old forests characterized by dense layered tree structural conditions (Old Forest Multi Story - OFMS) are also under-represented compared to estimated historic ranges.

Fire Behavior - Along with past disturbances, decades of successful fire suppression has led to development of denser forest conditions, increased levels of shade tolerant/fire intolerant tree species (namely grand fir) and accumulation of fuels and smaller understory trees resulting in an increased wildfire risk within the planning area as well as the neighboring private, state and other federal forest and range lands. An estimated 35% of the forest stands exhibit high levels (overstocked) of existing tree densities and 50+% of the planning area is characterized as departed from the natural fire regime. Similarly, an assessment of potential fire risk completed by the state of Oregon highlights pockets of elevated fire risk within and surrounding the East Face Planning area.

Whitebark Pine - The cold forests within the planning area include stands of whitebark pine trees which are listed as a candidate species for protection as threatened under the endangered species act (ESA). Whitebark pine trees are characterized by varying levels of mortality from an introduced disease known as blister rust. Additional threats to whitebark pine communities include increased encroachment by subalpine fir due to reduced fire frequency and increased vulnerability to changes in temperature and precipitation associated with predicted climate change scenarios. These whitebark pine communities provide a unique and valuable habitat for a variety of wildlife species and represent an increasingly rare high elevation forest type in the western United States.

Big Game Habitat - The geographic location of the project area along the east face of the northern Elkhorn Mountains provides unique and diverse wildlife habitat potential. The project area is situated in a transition area between winter range on the lower slopes/valley bottom and higher elevation summer range areas. Fire suppression and increased conifer densities have led to reduced amounts and distribution of early seral habitat in the planning area. Coupled with this, big game impacts to agricultural lands have been an issue for farms and ranches in the valley east of the planning area. In response, an intensive winter feeding program has been implemented for many years on the Elkhorn Wildlife Management parcel located adjacent to the planning area in an effort to reduce big game impacts to agricultural lands.

The lack of older forest conditions characterized by more open stands of fire tolerant species has also likely led to decreased abundance and distribution of wildlife that prefer these more open old forest habitat conditions. White-headed woodpeckers, flammulated owls along with a variety of other birds and mammals would benefit from increased amounts of old forest single story conditions across the project area.

Landscape Connectivity - The geographic location of the East Face planning area is in a key position for providing landscape connectivity between the agricultural, open range habitat and wilderness areas to the east, with the heavily forested Elkhorn Mountains and associated roadless and wilderness areas adjacent to and west of the planning area. The area is also used by a variety of wide ranging carnivores such as the pine marten. Past research has identified the importance of maintaining connections between key habitats within and surrounding the East Face project area for these and other species. Moist forests located on northerly aspects support important old forest structures and provide key corridors for both local and landscape connectivity of habitats. Identifying and incorporating connectivity corridors into the overall management of the area is important for maintaining local and landscape connectivity and habitat function.

Economics - Public lands are an integral part of the high quality of life found in Northeast Oregon providing a variety of social, economic and ecologic contributions to local residents and the public at large. The communities of northeast Oregon have a strong reliance on the natural resources of the area for providing fuel to heat homes, food for the table, employment opportunities and as a source of recreational enjoyment. Local ranching and agriculture rely on the water produced on the public lands and maintaining a healthy and reliable supply is critical for sustaining these key local industries. Similarly, the established infrastructures (mills, railroad, and roads) benefit from resource management activities on the public lands and the goods and services they provide.

Forest, ranching and recreational industries are key contributors to the local and regional economy and resource management opportunities afforded on public lands are an important part of maintaining and sustaining these industries, associated infrastructure and the overall quality of life. The East Face project offers a variety of opportunities to contribute to the local communities and economy through timber sale offerings, forestry service contract work, forest products for commercial and personal use, water to support ranching and agriculture, and providing a diversity of recreational activities for local and regional residents to pursue.

Watershed and Aquatic Habitat - Past road building throughout the area has resulted in changes in natural drainage networks and some road stream crossings have created barriers disconnecting aquatic habitats. Additionally, irrigation diversions on Anthony Creek create barriers to aquatic organisms and the lack of screening creates opportunities for entrainment of fish in irrigation ditches. Past harvest and wildfire impacts have likely reduced available larger woody debris by promoting development of dense small diameter forest conditions in many riparian areas.

Social - On the Wallowa-Whitman National Forest, as on other national forests across the country, disagreement over natural resource management has resulted in distrust amongst public stakeholders, and between public stakeholders and the Forest Service resulting in a lack of social agreement around active forest restoration treatments. Often, the disagreement is fueled by a lack of a common understanding about the need for, and consequences of, different types of forest management. However, over the past several years, *collaboration,* or diverse stakeholders working together to solve challenging problems that the stakeholders could not solve alone has become an increasingly important way to address natural resource disputes.

Purpose of and Need for Action

The purpose and need for action is usually generated by unacceptable conditions within the analysis area which need to be addressed. The purpose and need is represented by the difference or “gap” between the existing condition and its desired condition based on Forest and BLM Plan management direction. Therefore, there is a need:

- to restore and promote forest structural and compositional conditions reflective of historic ranges of variation across the planning area.
- to enhance landscape resilience to future wildfire, insect and disease risk, and capitalize on the opportunity to apply cohesive wildfire strategy principles across all landownerships.
- to maintain and enhance the overall representation of threatened whitebark pine stands in the planning area.
- to enhance the diversity and quality of habitat conditions across the planning area to help reduce ungulate impacts on agricultural lands and improve overall diversity and distribution of wildlife habitat.
- to maintain and enhance connectivity of ecosystems by providing corridors that will promote resilient and sustainable landscapes.
- to maintain and enhance local communities and economies by providing a diversity of resource management activities, recreational opportunities, commodity outputs, and ecosystem services from public lands.
- to provide drainage network connectivity between habitats to support self-sustaining populations of native fish.
- to build and strengthen relationships amongst the Wallowa-Whitman Forest stakeholders through a collaborative process that fosters mutual learning, ensures collective input and access to knowledge of the collaborative members, and helps develop understanding amongst stakeholders.

Public Involvement and Tribal Consultation

The Forest Service consulted the following individuals, Federal, State, tribal, and local agencies during the development of this EA:

The East Face Vegetation Management Project was published in the Wallowa-Whitman Schedule of Proposed Actions (SOPA), a quarterly publication, in December 2013 and has appeared in each quarterly SOPA since then. This mailing is distributed to a mailing list of individuals, organizations, and agencies and is published on the forest web page. The project and proposed action have also been published on the Wallowa-Whitman Web page at: http://www.fs.usda.gov/project/?project=41765 and the East Face of the Elkhorn Mountains Project webpage at: http://www.fs.usda.gov/detail/wallowa-whitman/landmanagement/projects/?cid=stelprd3791060.

The Wallowa Whitman Forest Collaborative established in June 2012, is comprised of more than 40 organizations and individuals passionate about working together on large scale management efforts. They engage in landscape-scale analysis and support the USFS' restoration and job creation efforts on the Wallowa-Whitman National Forest. The collaborative sponsored 2 public field trips to the East Face Project area on July 24, 2013 and July 23, 2014. They also meet on a monthly basis to discuss and collaborate with the Forest Service on the East Face Project.

East Face information was made available to the public at Miner's Jubilee in Baker City, Oregon in July 2014 and the Union County Fair in La Grande, Oregon in August 2014.

Scoping and consultation for the project was initiated and is ongoing with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR).

Scoping and consultation for the project was initiated and is ongoing with the Oregon Department of Forestry, Natural Resource Conservation Service, and Oregon Department of Fish and Wildlife (ODF&W).

A detailed description of the proposed action was mailed on January 15, 2015 to approximately 210 forest users, adjacent landowners, and concerned publics soliciting comments and concerns related to this project. Fourteen comment letters were received.

This project has been reviewed and approved by the State Historical Preservation Officer (SHPO).

Consultation with US Fish and Wildlife Service for threatened and endangered species has been completed for this project.

An analysis file for this project is available for public review at the La Grande Ranger District. The analysis file includes specialist's reports, data specific to the project, public notifications and their responses, meeting notes, and miscellaneous documentation.

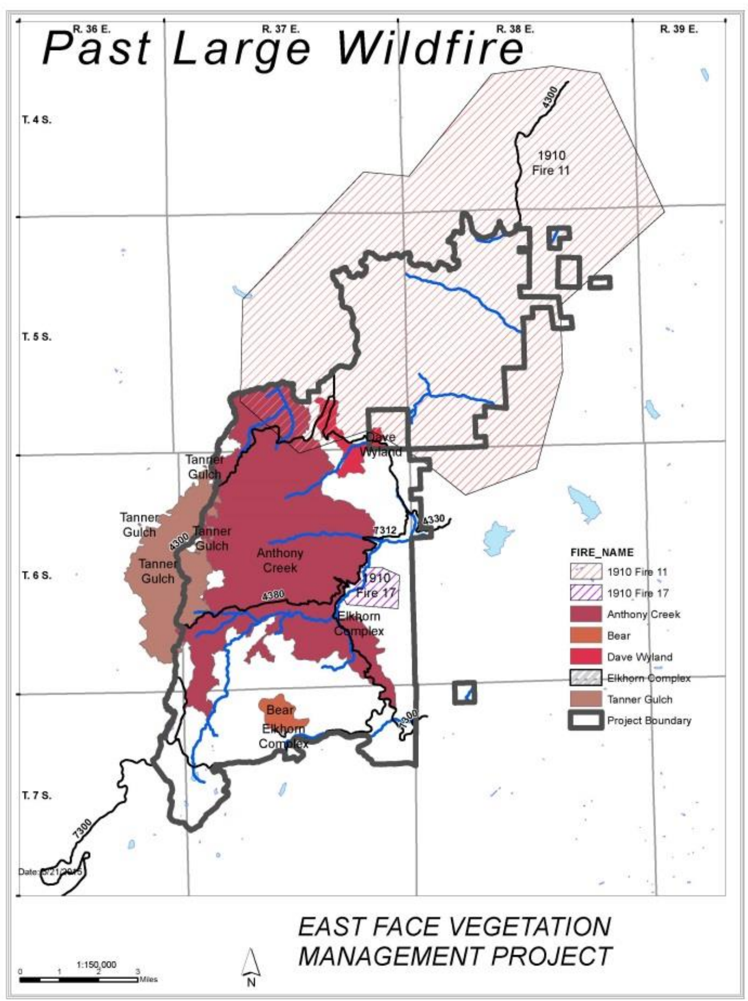


Figure 1A - Historic wildfires within the East Face Project Area

Key Issues

As a result of the public involvement described above, the following key issues were identified associated with the proposed action.   The interdisciplinary team of Forest Service resource specialists developed this list of issues and concerns with input from public scoping. *Specific issues brought up by the public can be found in italics in the key issues and other issues sections below*. The issues and concerns are the basis for subsequent steps of the analysis in formulating alternatives or developing constraints and mitigation measures.

Key issues were identified and subsequently used to develop a range of alternatives. The following section describes the key issues identified for this analysis and the key indicators used to evaluate each key issue.

Issue: Fire Behavior

Approximately 78 percent of the project area is within fire regimes that would exhibit mixed to high severity stand replacement fires in the event of a wildfire. Of these, approximately 50 percent have a moderate to high departure from the historic fire return interval. There is a long history of large stand replacing fires within the East Face project area with the most recent being the 4,000 acre 1989 Tanner Gulch fire and the 1,000 acre 2006 Red Mountain fire. Figure 1A displays some of the past large fire history within and surrounding the East Face project area.

Historically, fire was a dominant disturbance process in the Blue Mountains and based on the fire history within this project area has continued to be one. Normally, low intensity fires crept through the drier forests and grasslands every 7 to 35 years while moister sites generally experienced fire every 40 to 150 years. Fire history within this project area shows that within cold vegetation groups (fire regime group 4, table 1) the results of large expanses of stand replacement fires can be see today across the landscape. Within the other vegetation groups a mosaic of vegetation patterns resulting from a combination of hot, intense fires, and light surface fires can be observed. Fire regimes are a predicted frequency cycle for fire return intervals within a particular vegetation profile and described in the table below.

Fire Regime Condition Class (FRCC) reflects the current conditions' degree of departure from a modeled reference conditions. FRCC assessments measure departure in two main components of ecosystems:

- Fire regime (fire frequency and severity)
- Associated vegetation

Table 1 – Fire Regime Groups with Historical Fire Return Intervals

Fire Regime Group	Vegetation Types	Frequency (Fire Return Interval)	Representative Potential Natural Vegetation Group (PNGV)	Severity
1	All ponderosa pine types; Dry-Douglas fir/ pine grass; and grand fir/pine grass.	0 – 35 years	(PPDF1) Ponderosa pine Douglas-fir Inland Northwest	Low severity
2	True grasslands	0 – 35 yrs	(MGRA1) Mountain Grassland	Stand replacing, high severity
3	Mixed Conifer	35 – 200+ yrs	(GFDF) Grand fir – Douglas-fir	Mixed severity
4	Lodgepole pine, western larch, spruce	35 – 200+ yrs	(SPFI5) Interior West Lower Subalpine Forest	Stand replacing, high severity
5	Wet meadows, discontinuous grass scabs on ridge tops	Greater than 200 years	(RIPA) Riparian	Mixed severity

Surface fuel conditions are an important factor in wildland fire behavior. Heavy surface fuel loadings (over 10 tons per acre), lying under a dense tree canopy, create optimum conditions for crown fire. The increase in probability for stand replacement fire events increases the potential for loss of the remaining old forest.

Departure and condition class data can be used to document possible changes to key ecosystem components. Examples include vegetation characteristics (species composition, structural stage, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity and pattern; and other associated disturbances such as insect and disease mortality, grazing, and drought. Common causes of departure include advanced succession, effective fire suppression, timber harvesting, livestock grazing, introduction of and establishment of exotic plant species, and introduction of insects and disease (FRCC Guidebook, 2010). The following table describes the three condition classes:

Table 2 – Condition Class descriptions

Condition Class	Description
1	Represents ecosystems with low departure (<33%) and that are still within an estimated historical range of variation as determined by modeling.
2	Represents ecosystems which have been moderately altered (33 to 66%) from the reference conditions.
3	Represents ecosystems with a high departure (>66%) from the reference conditions.

Table 3 – Condition Class Acres by Fire Regime Group for the Project Area

Existing Fire Regime Condition Class						
Condition Class	**Fire Regime 1**	**Fire Regime 2**	**Fire Regime 3**	**Fire Regime 4**	**Fire Regime 5**	**Percent of project area**
1	4,118	169	14,024	3,879	10	**50**
2	1,070	145	8,199	4,599	0	**31**
3	3,704	576	3,793	510	0	**19**
% of project area	**20%**	**1.9%**	**58%**	**20%**	**.1%**	

Example of Fire Regime 3, Condition Class 2

Example of Fire Regime 1, Condition Class 3

The 1960 Anthony Creek burn pictured here on the left was a stand replacement fire event which covered over 15,000 acres within the East Face project area. Currently, these acres have come back as a thicket of overstocked dog hair lodgepole pine pictured below. It is severely overstocked with abundant ladder fuels which would easily carry ground fires into the crowns resulting in severe mortality.

A community at risk" (CAR) is defined as a group of homes or other structures with basic infrastructure and services within or near federal land. A wildland urban interface area surrounds a CAR, including a community's infrastructure or water source, and may extend beyond 1.5 miles of the CAR, depending on topography and geographic features used as an effective firebreak.

There are three wildland urban interface (WUI) areas located within the East Face Project Area:

- Anthony Lakes WUI - 45 structures
- Rock Creek Bulger Flats WUI - 124 structures
- Beaver Creek Watershed – Municipal watershed for the city of La Grande.

The project area is also in a highly active lightning path which puts this entire area at risk to fire starts and the potential for a wildfire to come out of or go into some or all of these WUIs. Surface and ladder fuels have increased, and continue to increase as a result of suppression activities over the years. *While there was support expressed for treating adjacent to private lands, WUIs, and recreation residences; concern was also voiced over the mechanical treatment of fuels in the proposed action and the potential for short-term increases in fuel loadings/fire hazard due to logging slash and the drying effects of increased light and winds reaching the forest floor in treated stands.* Management designed to reduce hazardous fuels could modify fire behavior thus reducing risk to property and resources including downstream water quality and quantity while increasing fire suppression opportunities.

Concern was raised over the blanket use of fuel reduction and CWS across the entire project area instead of focusing on priority one areas/structure ignition areas (defined as within 100' of structures). The need for ecological rationale and/or objectives for treating outside of these areas was also expressed.

Feedback on the Proposed Action indicated support for the use of prescribed fire, especially in fire adapted ecosystems. There was also support for the use of mechanical fuels reduction (timber harvest) as a pre-treatment for prescribed burning. Several commenters asked that mechanical treatment be considered at all times before burning, because industry could use the fiber and wood products. The effectiveness of thinning as a fuels reduction tool was supported by several commenters in warm/dry biophysical environments, but thinning in cool/moist biophysical environments was not supported because it cannot emulate the mosaic pattern of this fire regime. Comments were also received advocating for the treatment of riparian areas in order to reduce fuel loadings and protect these sensitive areas in the event of a wildfire.

Key Indicators:

- ***Acres of treatments by Priority Area –*** Number of acres of treatments that are proposed within each priority area.
- ***Size of fire in acres one hour after igniton –*** a realitive measure to compare wildfire spread rates.
- ***Fire rate of Spread –*** Distance a fire will spread in one hour.
- ***Fire Flame Length –*** The length of the flame in a spreading fire within the flamimg front.
- ***Torching Index -*** is the 20 foot wind speed at which a ground fire will torch into the crown initiating a crown fire. The lower the torching index, the lower the wind speeds need to be to

initiate torching. A torching index of 0 means that there is a very high potential for a crown fire to occur.

- ***Crowning Index*** **-** is the 20 foot wind speed at which active crown fire is possible. The lower the crowning index, the lower the wind speeds need to be to initiate active burning in the crown and spread through the canopy. A low crowning index (closer to 0) indicates that there is a very high potential for an active crown fire.

Issue: Old Growth

An analysis of the historic range of variability (HRV) was done to assess how current forest conditions compared to what ecologists believe existed during the pre-settlement era (East Face Analysis File). The East Face project area was used as the landscape scale to determine the amount and distribution of old forest habitat. This is an appropriate scale to analyze HRV and is meaningful in terms of landscape patterns as they relate to the distribution of wildlife habitat. HRV is important to wildlife populations because the distribution, quality and quantity of habitat largely determine the potential for a wildlife species to exist at viable levels. As habitat was converted, fragmented, and opened to motorized access, many species were reduced in number and others were precluded from portions of their geographic range altogether. The following table compares existing old growth acres to the HRV in the project area.

Table 4 - Comparison of existing old forest to HRV by potential vegetation group (PVG) in the East Face project area

PVG	Existing Acres	% of PVG	Historical Range %
Old Forest Multi Stratum (OFMS)			
Moist upland	2,277	12%	15-20%
Dry upland	929	10%	5-15%
Cold upland	2,574	16%	10-25%
Old Forest Single Stratum (OFSS)			
Moist upland	27	0%	10-20%
Dry upland	257	3%	40-60%
Cold upland	392	2%	5-20%

The table above illustrates large deficiencies in OFSS for moist, dry, and cold upland sites. OFMS levels are within HRV in dry and cold potential vegetation groups (PVGs) and slightly below in moist upland PVGs. The greatest opportunities to move stands toward OFSS structure exist in dry and moist upland sites that are currently classified as OFMS. There are 2,906 acres of dedicated old growth areas (MA 15) in the project area.

Because old forest levels are well below desired levels in the project area; existing stands need to be maintained or enhanced and other stands accelerated toward old forest structure.

Some of the public input on the Proposed Action related to Old Forests advocated for the protection of old growth within the project area and all trees with old growth characteristics regardless of their diameter. They also indicated that treatments should be focused on ecologically appropriate dry plant association group forests and not in moist old forests which they state are not outside of their historical pre-fire suppression conditions. They advocated for the reintroduction of variable severity fire to the area.

Key Indicators:

- Acres of OFMS restored to OFSS

Issue: Economics

There is a concern over the cost efficiency of timber harvest to achieve management goals while protecting resource values. One of the goals of the Wallowa-Whitman Forest Plan is to provide for the production of wood products to satisfy National needs and benefit local economies consistent with natural resource objectives, environmental constraints, and economic efficiency. There is an opportunity through project design of the East Face project to meet the purpose and need within the project area, produce an efficient timber sale offering, protect resources, and benefit local economies.

Factors which relate to cost efficiency include silvicultural prescriptions, stands selected for treatment, size of harvest units, size of material to be removed and degree of merchantability, miles of road needed in relation to selected stands, yarding systems, and fuel treatment measures. All these factors have the potential to increase the cost involved with accomplishing management in this area.

To meet the projects need for desired stand health, structure, and reduced fuel loadings the treatments often call for removal of low value, low volume, small diameter materials. The costs associated with removing smaller diameter live trees can be quite high while the economic return is low, this could possibly produce a deficit or marginal timber sale offering.

Public comments supported having this project provide wood products and jobs to this distressed area as a goal for the project. Concern was also raised over the Forest's ability to fund non-commercial fuel reduction activities and recommendations were made to consider increasing amount of timber removed to help fund non-commercial treatments, reducing the use of expensive logging systems such as helicopter yarding and making non-commercial units commercial to improve sale economics.

One commenter also pointed out that dead and dying trees are important to the survival of many natural resources in the forest and should not be removed to provide opportunities for corporate profit or to produce private industrial tree farm conditions.

Key indicators:

- Total Investments
- Wages Earned
- Number of Jobs

Issue: Improvement of Long Term Forest Health Conditions and Sustainability

A combination of past management activities and exclusion of fire along with the results of acres of post fire overstocked lodgepole pine stands has led to an increase in stocking levels, fuel loadings, and dense understories. Overstocking, insects, and disease are threatening the health and vigor of many stands within the project area. Stands are not growing to their site potential and if left untreated in the proposed action, stand development could remain stagnated and increase the risk for further loss from insect mortality and wildfire.

Approximately 37% of the forested East Face area consists of cold upland forest which includes sub-alpine fir/grouse huckleberry, lodgepole/ grouse huckleberry, and grand fir/grouse huckleberry plant associations, 43% is moist upland forest which includes lodgepole/ big huckleberry, sub-alpine fir/ big huckleberry, grand fir/twinflower and grand fir/big huckleberry plant associations and 20% of the forested area is dry upland forest including Douglas-fir/elk sedge, Douglas-fir/pinegrass, ponderosa pine/bitterbrush, and grand fir/pinegrass plant associations.

In the East Face project area mountain pine beetle, western pine beetle, spruce beetle, fir engraver, western spruce budworm, and balsam wooly adgelid populations have shown an increase in activity the last few years. Stands have pockets of beetle kill and recent attacks. Overstocked stand conditions increase the risk of further insect and disease activity.

Public feedback from the Proposed Action varied from support of commercial timber harvest within the area as a tool to meet project objectives and reduce the risk of loss to insects and disease to pointing out that insect activity is a beneficial natural disturbance event in the forest because when trees die they provide important habitat for wildlife and bird species as well as replenishing the organics in the soil. One commenter questioned the ecological rationale for the use of regeneration harvest such as sanitation, shelterwood, and patch openings in this project area.

Key Indicators:

- Acres of overstocked stands treated within the project area
- Percent of overstocked stands treated within the project area
- Percent of project area change toward desired species cover type

Issue: Unroaded Areas

Some public comments indicated that ecologically significant unroaded areas should be protected and not proposed for roading or harvest activities in order to maintain the undeveloped character of undeveloped or roadless areas and retain the potential for future consideration as wilderness

Inventoried roadless areas (IRAs) are immediately adjacent to this project area. These areas were identified in the 2001 Roadless Area Conservation Rule in a set of IRA maps, contained in the Forest Service Roadless Area Conservation Final Environmental Impact Statement, Volume 2, dated November 2000, which is located at the National headquarters office of the Forest Service, or any subsequent update or revision of those maps (36 CFR 294.11). These areas were set aside through administrative rulemaking and have provisions, within the context of multiple use management, for the protection of IRAs. Most IRA boundaries are substantially identical to those identified as “Roadless Areas” referred to in the 1982 planning rule (36 CFR 291.17) and identified by the Forest Plan, FEIS, Appendix C; however some localized, minor difference in boundaries may exist.

The East Face project area is immediately adjacent to the southern side of the Beaver Creek IRA and borders the northern edge of the Twin Mountain IRA along the 7300 road. All roadless areas were allocated to various management areas strategies as disclosed in the WWNF Forest Plan FEIS, Appendix C and described in the Record of Decision (pages 14-16) for the FEIS. Some management area strategies were intended to retain the undeveloped roadless character of the roadless area and some management area strategies were intended to develop the lands with timber harvest and road building activities. None of these areas are within the East Face project area. No lands within the East Face project area were identified with the potential to be recommended to Congress for inclusion in the National Wilderness Preservation System or as Wilderness Study Areas during the Blue Mountain Forest Plan Revision planning process.

As discussed under the fire behavior issue above, the East Face project area and the adjacent IRAs are severely outside of the range of historic fire return intervals. The Beaver Creek area experienced heavy tree mortality during the 1970s due to insect infestations from mountain pine beetle, western spruce budworm, and Douglas-fir beetle infestations. The mountain pine beetle outbreak in and adjacent to the Beaver Creek IRA occurred from 1975-1980 and impacted approximately 7,250 acres of mature, dense stands of lodgepole pine. Large areas north and west of the La Grande Reservoir sustained heavy tree mortality. Although several salvage sales were proposed within the project area following the outbreak, no timber harvest took place. Fire exclusion has led to the accumulation of high fuel loads as these insect killed trees have now fallen and become a deep contiguous bed of fuel. Ecological processes would dictate that the next cycle would be a fuel consuming fire(s) burning with the greatest intensity in these pockets of heavy fuels.

The stand types within the Beaver Creek and Twin Mountain IRAs historically received large stand replacement fires on 50 to 150 year intervals. Exclusion of fire, in conjunction with acres of insect-killed timber, has created high fuel loads. A fire in extreme weather conditions could kill vegetation, sterilize soil, remove shade-producing structure, and reduce soil stability. Under a normal fire regime, these effects would not be expected to occur on a large scale; however, due to the stand types within these areas and because the area is outside of this regime a large severe fire within these IRAs would not only impact the roadless values but also water quality impacts to the City of La Grande municipal watershed which resides within this area.

There are no lands inventoried for wilderness character on BLM lands within the project area.

Key Indicators:

- Acres of Blue Mountain Forest Plan Revision Potential Wilderness Areas (PWA) treated
- Acres of commercial and non-commercial treatment within identified undeveloped area

Issue: Landscape Connectivity

Landscape patterns can influence disturbance processes, nutrient cycling, and plant and animal distribution. These patterns are dynamic and are influenced by natural and human-induced disturbances. The desired condition for landscape patterns is to have them be spatially and temporally diverse creating a positive influence on overall ecological functions, scenic values, and providing for connectivity by allowing animals to move across landscapes.

The geographic location of the East Face planning area is in a key position for providing landscape connectivity between the winter range habitat in the Elkhorn Wildlife area and summer range habitat on federal lands. It also provides connectivity between the Beaver Creek and Twin Mountain inventoried roadless areas. The area is also used by a variety of wide ranging carnivores such as the pine marten. Past research has identified the importance of maintaining connections between key habitats within and surrounding the East Face project area for these and other species. Moist/cold forests located on northerly aspects support important old forest structures and provide key corridors for both local and landscape connectivity of habitats. Maintaining landscape permeability into the overall management of the area is important for local and landscape connectivity and habitat function.

Key Indicators:

- Acres of disturbance within key connective corridors

Issue: Road Access

Public input on the Proposed Action indicated concerns that the project area roads are in disrepair and insufficient for management, recreation, firefighting, and timber harvest. While there was some support for the decommissioning and road closure for resource protection there were a few letters which did not support temporary road construction and reconstruction due to the longevity of those road beds on the landscape and potential for soils and water quality impacts. One commenter posited that scientific proof exists that roads can damage the proper ecological functioning of natural resources in a forest.

There are approximately 364 miles of NFSR in the East Face project area. Of these miles, 127 miles are managed as open and 237 miles are managed as closed. Approximately 13 miles of the Elkhorn Drive State Scenic Byway traverses the southern edge of the analysis area boundary. This road is a double-lane, paved road which has a variety of RV, truck, passenger car, and tourist traffic year round. Most of the road prisms within the project area exist in a variety of conditions. Some are passable with no work needed, while some need a significant amount of road work to become passable to even high clearance vehicular traffic. Currently, in the Forest's INFRA database, there is over $1 million in deferred maintenance in the East Face analysis area. Some road prisms are still visible from old roads which were decommissioned several decades ago.

There is one bridge located on NFSR 7312 that is considered structurally deficient, and currently has a load rating of 10 tons placed on it. This means that commercial haul and generally any type of large truck traffic (empty or loaded) would not be permitted to haul across it without some form of bridge reconstruction or replacement. This bridge is located at the crossing of the North Fork of Anthony Creek.

Concern was also raised about the impacts of motor vehicle use on big game security habitat due to motor vehicle use on open and closed roads in important winter and summer range in the project area.

Key Indicators:

- Miles of new temporary road constructed
- Miles of temporary road on existing wheel tracks
- Miles of road reconstruction
- Seasonal motor vehicle use restrictions (Yes/No)
- Miles of currently closed roads to be reopened for project use

Other Issues

The following issues were raised during public scoping for this project; however, they were either resolved during project design or outside of the scope of actions proposed in this project.

Resolved in project design:

- Improve Big Game Habitat: change treatment prescriptions to provide 50% canopy closure, create travel lanes, thin leaving 10% and 15% no treat areas with skips and gaps – because slash will be at low levels in the proposed action to meet fuel reduction goals big game movement will not be impeded within treated stands. Stands selected for treatment with pine grass will have lower canopy closure following treatments which will improve available forage where appropriate ground cover is available.

- Treat encroachment in meadows and do aspen enhancement: Meadow encroachment is not an issue in this project area. There are also very few aspen stands within the project area. A common element for all action alternatives is the pursuit of aspen enhancement activities in non-commercial units where aspen has been discovered.

- Protect all trees with old growth characteristics no matter what their size – While not all of these trees can be retained due to fuel reduction goals, some of these types of trees are retained where possible in treatment units. In the marking guide, trees with multiple stems, or crooks, or sweeps are retained to provide wildlife habitat, trees should generally be greater than 12" dbh. Preferred location for retaining these trees is in the areas that are at or below recommended basal area.

- Seasonally close roads recommended for decommissioning the year before they are decommissioned – the roads recommended for decommissioning are already currently closed.

- Perform handwork only around whitebark pine – this is already part of the prescription for treatment of these areas (refer to common elements section).

- Consider using promulgated closure orders on closed roads that have been opened for use at the completion of the project – These roads are all scheduled to be reclosed at the completion of fuel reduction activities and promulgated under Alternative 5.

- Consider options for prescribed burning across boundaries into the Elkhorn Wildlife Area for fuel reduction, fire reintroduction, and forage enhancement – Prescribed burn block units 613 and 614 have been added to the Proposed Action (refer to Alternative 2) and carried forward into other action alternatives as appropriate.

- Treatment in RHCAs: treatment was recommended Category 4 RHCAs and in all RHCAs followed by restoration, no treatment in RHCAs was also recommended or only in non-commercial treatment units – Riparian surveys indicate that there is no need to treat in most RHCAs because they are currently in very good condition. Non-commercial RHCA treatments called for in the proposed action are primarily in past harvest units which would benefit from some density management to maintain their health and vigor. Because only handwork is considered, enlarging buffers would not change/improve benefits to RHCA.

- Protect soils, water quality, cultural resources, and sensitive plant species – Covered under project design, management requirements, constraints, and mitigation measures.

- Retain all trees 21 inches dbh and larger - Covered under project design, management requirements, constraints, and mitigation measures for all Forest Service lands.

Outside the Scope:

- Identify non-motorized trail opportunities on currently closed roads to be re-opened for use in this project – This action is outside of the purpose and need for this project. Options and opportunities for future non-motorized recreation planning will be maintained within the project area through methods of closure, etc.

- Don't make scoping the only public interaction – A preliminary EA will be available for the comment period mandated under 36 CFR 218.22(a).

- Do a forest-wide Forest Plan amendment for logging in old growth stands below the historic range of variation – A forest-wide plan amendment is not appropriate at the project level scale. A forest-wide amendment would require a separate analysis. The amendment proposed in this project is specific only to this project due to the need for treatments within the WUIs located within and adjacent to the East Face project area.

- Consider using more regeneration prescriptions within the project area – Stand treatment prescriptions were determined during field reconnaissance based on desired fuels reduction and stand health goals. Specific prescriptions were identified to meet these goals based on the ecological needs of the stands. There is no ecological need to change intermediate prescriptions to regeneration prescriptions outside of those already identified.

Alternatives Considered, but Eliminated from Detailed Study

The following alternative options were considered during the development of this analysis but were eliminated from detailed study as described below.

Alternative A – Prescribed Fire Only in Areas Not Previously Harvested:

An alternative utilizing only prescribed fire in areas which have not been previously harvested was considered by the ID Team. Eliminating mechanical harvest and commercial removal of the wood products also reduces the amount of prescribed fire opportunities within the project area due to elimination of pre-treatment.

Under this alternative higher mortality is anticipated because the fuel loadings within these areas would not support a controllable fire without pre-treatment. In general, mortality within the dominant canopy trees would range between 30-50%, codominants would experience an estimated 40-60% mortality and mortality of the seedling/sapling component would range between 70-90%. The level and arrangement of mortality would be random and not necessarily retain the best trees on site and would likely kill some of the most desirable and suitable retention trees.

This alternative was eliminated from detailed study because it fails to respond to the purpose and need.

Alternative B – Cut trees ≥ 21" dbh:

This alternative was considered; however, it was determined across the area that in most cases anything in excess of what is needed to meet desired stand structure and green tree recruitment requirements, etc. had already been cut in past timber sales or are the only remaining large trees in historic fire areas. This alternative in its entirety will not be considered under this analysis.

Alternative C – No Commercial or Non-commercial Treatments in Cool/Moist/Cold Potential Vegetation Groups (PVGs)

Approximately 78% of the project area is in moist and cold upland forest PVGs. Not treating in moist/cold PVGs will not only not meet the purpose and need for this project but it will also not respond to climate change concerns because it would not improve stand resiliency.

This alternative was eliminated from detailed study in this EA because it would fail to adequately respond to the purpose and need.

Alternative D – Change Helicopter Systems to Ground Based

This alternative would have changed all helicopter yarding systems to skyline yarding. In order to accomplish skyline yarding of the 5 helicopter yarding units (109, 132-135) seven new roads totaling approximately 7.32 miles of new road construction would be required. Stump to truck logging costs for helicopter yarding are approximately twice as much as ground based skyline yarding costs. The potential savings that would be realized harvesting these 5 units with a skyline yarding system (savings/MBF) was compared to the cost of the new specified road construction required to facilitate this yarding system. The new road construction cost approximately $50,000 more than what would be saved by switching systems; therefore, not only is it more economical to stay with the helicopter system but it would also minimize impacts to soils and visual quality objectives. If a ground based system had been used in these units, a forest plan amendment for visual impacts within the 73 Road scenic corridor would have been necessary.

This alternative was eliminated from detailed study because it is not economically feasible and to comply with the visual requirements of the 1990 Forest Plan.

Proposed Action and Alternatives Considered in Detail

An ID team developed alternatives based on the purpose and need of the project and the key issues and other concerns identified in Chapter 1 of this assessment. Forest Service management objectives are incorporated into alternatives by following standards and guidelines of the Wallowa-Whitman National Forest Plan as amended.

NEPA requires that the agency study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.

Elements Common to the Action Alternatives

The following elements are common to all action alternatives.

1. Priority treatment areas

The East Face project has been divided into the following 3 areas based on their proximity to private property, values at risk from wildfire, and/or logical locations for suppression operations.

Priority One (All WUI areas and areas generally within 1.5 miles of private land)

Dense mixed conifer stands with heavy accumulations of dead and down material have created hazardous fuels conditions along the forest boundary and within the WUI's. There is a need to strategically place treatments in areas that would slow the progress of wildfire towards the interface, while providing a defensible fuels profile zone (DFPZ) for firefighting resources. Treatments would be focused on:

- Creating a DFPZ along the boundary between public and private owned land.
- Creating a DFPZ adjacent to Twin Mountain Roadless Area along 73 road.
- Creating defensible space around the structures and improvements within the Anthony Lakes WUI.

Priority Two (Strategic placed fuels breaks outside of the WUI or not with 1.5 miles private property)

Dense conifer stands and heavy accumulations of surface fuels beneath the canopy have created hazardous fuels conditions throughout the project area. The proposed treatments would be anchored into the existing road system and reinforced by natural barriers. These treatments would not be designed to stop a wildfire but provide suppression forces a higher probability of successfully managing a wildfire with indirect suppression tactics.

Priority Three (Treatments not within WUI or within 1.5 miles of private, or not part of a strategic fuels break).

There is need to restore and promote forest structural and compositional conditions reflective of historic ranges of variation across the planning area. Treatments would be designed to manage vegetation for multiple purposes, including hazard fuels reduction, ecosystem restoration or maintenance, silviculture and wildlife.

Within these areas, a series of strategically located defensible fuel profile zones (DFPZ) would be created. A combination of mechanical harvest and fuel reduction treatments designed to reduce crown fuels followed by surface fuel reduction treatments would occur within these DFPZs. Treatments in Priority Area 1 would complement treatments on Private and State lands where possible with a goal of creating a contiguous DFPZ along and across these boundaries using stand treatments and natural features. In the other areas, treatments would be on either side of roads where possible and incorporate existing natural fuel breaks and topography. Zone width would vary following stand types and needs recognizing areas where a more logical topographical or vegetative break or other resource/management need dictate a narrower or wider strip.

2. Silvicultural Treatment Prescriptions/Objectives

Because the purpose and need for this project focuses on strategically located fuel reduction activities, restoring and promoting forest structural and compositional, and enhancing landscape resilience to future insect and disease risk, stands were chosen for treatment primarily due to their stocking levels, current fuel loadings, stand conditions (such as an abundance of ladder fuels due to overstocked conditions) and location (focusing along roads, ridgetops, and roadless/private land interfaces). All of these stands were examined and when stand conditions indicated that stocking level and fuel reduction goals may be accomplished by timber harvest resulting in a commercial product, they were given a silvicultural prescription to meet the objectives described below.

Prescriptions/objectives:

The following describes the treatment objectives, methods and anticipated outcomes for the proposed vegetation management activities within the project area.

Stocking Levels for Forested Stands – Stand density ranges have been developed for each conifer plant association (PAs). See Powell et.al. (1999) for management zone basal areas. The range is based, in part, on the growing capacity (or site potential) of each plant association. Tree densities would be reduced to various basal area levels depending on management objectives. The range of basal area stand can be managed for are defined by the upper management zone and the lower management zones as described below:

Upper Management Zone (UMZ) – For the East Face project area the UMZ will be the level of tree stocking that maintains the maximum amount of sustainable tree cover. This level avoids development of suppressed trees and precludes significant amounts of density-related tree mortality.

Lower Management Zone (LMZ) – The lower limit of full site occupancy where a significant portion of site resources can be allocated as tree growth.

Prescriptions:

Sanitation harvest (HSA) prescription is designed to remove diseased and insect damaged trees and associated trees with a high potential to become infected. The trees to be removed with this prescription in East Face are a mix of Douglas-fir and western larch with mistletoe. The treatment will remove those trees with multiple mistletoe brooms and reduce the incidence of future mistletoe. The objective in these stands will be to promote non-susceptible species in the understory. For example, in stands with Douglas-fir mistletoe treatments will promote ponderosa pine and western larch.

Thinning harvest (HTH) prescription is designed to stimulate the growth of the desired residual trees.

Shelterwood harvest (HSH) prescriptions in which a stand of trees is established through a series of cuttings designed to facilitate establishment of a new cohort of trees. It will also move stands toward more seral species composition. Due to site conditions, scattered overstory trees are retained to provide some shade or site protection for the regenerating stand beneath it and materials for future down wood recruitment.

Partial Removal harvest (HPR) prescription is the partial removal of the overstory over an established understory. Trees retained in the overstory are at levels adequate to meet green tree recruitment needs.

Improvement harvest (HIM) thinning and removal of undesirable trees (poor form, damaged condition, ecologically inappropriate species etc.) within a stand for the purpose of improving the growth, composition and quality of the remaining stand.

Fuels Harvest (HFU) prescription in which trees creating ladder fuels and excess down dead woody material are removed offsite with the use commercial harvest methods.

Patch Openings (HPO) prescriptions treat about 10% of the stand and create holes that will promote early successional structure and early seral species such as western larch, western white pine. The goal of these treatments would be to create some heterogeneity in stands that are predominately even-aged lodgepole with some associated species. Prescription would create small canopy openings (4 to 6 acres) focusing on promoting pine and larch to improve stands resilience to wildfire and insect and disease outbreaks. Most of these stands would also have an intermediate treatment that will be done outside the openings to reduce densities down to approximately 100 trees per acre. Planting would be used in patch openings to supplement natural regeneration and meet stocking requirements where needed.

Precommercial thinning (PCT) thinning of smaller diameter selected trees in a young stand to stimulate the growth of the remaining trees. May be accomplished by manual or mechanical (slash buster) methods.

Post-harvest follow-up:

Units would be monitored following harvest activity for site preparation, regeneration, or stand improvement needs. Reforestation work would be accomplished on sites that are below recommended stocking levels (180 – 300 trees per acre depending on the site) through planting or natural regeneration. Other post-harvest treatments may include precommercial thinning, site preparation and/or fuels reduction with fire, grapple/slashbuster manipulation of slash, and site preparation by whip felling.

3. Fuels Reduction

Fuels treatments proposed under this project are designed to move stands from their current structure and development trajectory. Strategies for restoring forest structure and function include thinning live trees, and burning surface fuels to reduce the risk of severe crown fires. Objectives in all units include: reduce stand densities in overstocked stands, reduce fir encroachment in pine dominated stands, remove ladder fuels, create defensible fuel profile zones in strategically sound locations, return fire as a disturbance factor, and promote healthy fire resilient stands where appropriate.

General Mechanical Prescriptions:

Associated with harvest units the following activities would occur:

1. Treatments would reduce overstocking of trees less than 7” dbh to recommended stocking levels per plant association.
2. All snags ≥12” dbh would be retained.
3. Down wood would be retained at levels described under the Wildlife mitigation measures in this Chapter. All other materials >3” in diameter could be reduced to 3 tons or less per acre.

Fire/Fuels Units (FFU) – These non-harvest units (refer to alternative descriptions for unit numbers and acres) would receive a mechanical fuels reduction treatment designed to increase the effectiveness of the proposed prescribed burning. The following treatments may occur within the proposed FFU unit boundaries:

- Thinning/cleaning of trees less than 9” dbh
- Mastication (slash-busting) on slopes less than 30%
- Lopping and scattering thinning slash
- Pruning on leave trees
- Hand piling of thinning slash and natural fuels concentrations
- Grapple piling of thinning slash on slopes less than 30%

Fuels Reduction Mechanical (WFM) - consists of pre-commercial sized tree density management followed by a surface fuels reduction using a combination of hand work, mastication (slash busting) or grapple piling where surface fuel loadings exceed 15 tons/acre. Mechanical activities would not be allowed within INFISH buffers in these units.

Prescribed Burn Units - Over the next 10 years, prescribed burning would occur when weather and fuel conditions are appropriate to meet the objectives for each unit. No more than 10% of the available forage within the project area would be burned per year. Existing plantations and precommercial thinning areas would be avoided during burn layout and implementation. Control lines would include roads, machine lines, hand lines and natural barriers.

General Prescribed Fire Prescriptions:

1. Fires would generally be low intensity (1-3 foot flame lengths).
2. Desired fuel loading would be as listed in the following table:

Table 5 - Fuel Size Class

Fuel Size Class	Desired Tons/Ac	Lineal Feet
0-3” Diameter	<2	0
3-9” Diameter	<3	0
12” Plus Diameter	5	120-140

a. Trees ≤ 2” dbh would be reduced to desired levels.

Mechanical fire lines (less that 2ft wide) would be constructed between road segments or natural barriers to provide containment lines prior to unit ignition. Burning along private land boundaries would be coordinated with adjacent landowners.

With the exception of the RHCA hand treatment units described above, all other treatment units calling for the use of prescribed fire would not permit direct ignition within 300' of any Class I, 150' for class III stream channels and 50' of Class IV stream channels. Low intensity fire would be allowed to back into all RHCAs. Reducing these fuels will enhance forage habitat and increase overstory growth rates by making nutrients readily available after burning is completed.

General Handwork Prescriptions:

Fuels Reduction Hand Work Only (WFH) - treatments are designed to remove ladder fuels and manage understory tree density at appropriate levels using manual methods. Ladder fuels are defined as trees (less than 7" DBH) growing under the drip line of the dominant and co-dominant trees within the project area. These trees provide a ladder for flames into the crowns of the larger trees increasing the probability for high crown fire. Dead and down fuels would also be also be piled and burned.

Pre-commercial Thin (PCT) - Manual pre-commercial thinning of past harvest units would result in variable spacing (14-20 feet between trees) including retention of approximately 10% of untreated area to provide for wildlife habitat needs. Species preference will be western larch, ponderosa pine and Douglas-fir. Riparian areas may be treated as described below.

4. Roadside Hazard Trees

Danger trees (standing trees that present a hazard to people due to conditions such as, but not limited to, deterioration or physical damage to the root system, trunk, stem, or limbs and the direction of the lean of the tree would allow that tree to reach the roadway if it fell) would be cut along all haul roads (approximately 15 trees/mi). If the trees are within no-activity RHCA buffers as described previously or needed to meet down wood requirements they would be cut and left on site. If they are outside of those areas or not required to be retained for other resource needs and are of commercial value, they may be removed with this timber sale.

5. Riparian Habitat Conservation Areas (RHCA)

RHCA vegetation is also in need of management to reduce overstocking and fuel loadings. Handwork only would occur in RHCAs. Precommercial thinning units (PCT) and hand treatment only fuel reduction units (WFH) would have no activity buffers of 10 feet along class IV streams (intermittent non-fishbearing), 30 feet on class III streams (perennial non-fishbearing), and 50 feet along class I streams (fishbearing). No mechanical treatment or commercial removal would occur within RHCAs. Depending on the amount of slash generated, hand piling and hand burning of slash piles would occur outside of no activity stream buffers.

Minimum stream buffers for direct ignition during prescribed burning are:

Class I streams = 100 feet,
Class III streams = >75 feet
Class IV streams = >50 feet

6. Scenic Resources

In order to meet the intent of high to moderate scenic integrity along areas viewed from the Elkhorn Scenic Byway, the Anthony Lakes Recreation Area, Forest Road 7312, Wolf Creek Road 4315, and Forest Road 4300 a variety of criteria such as retention of large trees, screening, low stumps, and marking trees on the side away from these roads, etc. will be coordinated with the project Recreation Specialist and applied to treatment units during layout, marking, and implementation.

7. Connective Corridors

The goal within connective corridor units would be to maintain and enhance their canopy closure and structural complexity. Snags, large down wood, and multiple canopy layers (if appropriate for the site) would be maintained in these stands. Basal area would be maintained within the upper half of the management zone, which would approximate canopy closures in the upper 1/3 of site potential. Stocking levels would be managed near the upper management zones for basal area except where tree quality and crown conditions are such that this level of stocking is unattainable, in these areas, 20% of the stand would be retained in untreated clumps. Trees with as little as 20% live crown would be retained if needed to maintain basal area levels. All snags greater than or equal to 12 inches dbh would be retained. Down logs would be retained at the following levels:

- 200 lineal feet per acre
- Minimum lengths of logs 20 feet or largest available
- Minimum of 12” small end diameter logs or largest available

8. Snags in Harvest and Fuel Reduction Units

USFS Snag Guidelines:

With the exception of an occasional snag removed for safety or construction clearing, no snags >12 inches dbh would be removed within these units.

Protect existing standing large snags (>12 inches, DBH) during firing operations through avoidance or fuels distribution requirements (FDR) as practical. If large trees are killed through project implementation they will be left for wildlife snags, unless they pose a safety hazard to roads, the public, or project personnel.

BLM Snag Guidelines:

Hot/dry Forest - retain at least two large (greater than 18 inches dbh, greater than 30 feet in height) snags per acre.

Warm/dry Forest – retain at least 3 large snags per acre greater than 18 inches dbh.

9. Enhancement Work

A. **Aspen Enhancement -** Where aspen is encountered in non-commercial treatment units, treatments around them will be coordinated with the project Wildlife biologist to enhance aspen habitat. Conifers that encroach upon aspen stands compete for the limited resources of moisture, nutrients and light. Aspen are shade intolerant and susceptible to conifer competition and without disturbance, conifers will eventually overtop the aspen, reduce aspen over story and contribute to aspen stand collapse. The objective of conifer reduction in aspen stands is to reduce shading and competition to increase aspen sprouting and expansion. Reducing conifer competition will allow the aspen component the greatest ability for survival. In stands where aspen and conifers have less than 20% canopy closure both species can successfully coexist. Partial conifer retention would allow old tree conservation, stream shading and maintain diversity of conifer species. Conifer basal area will be reduced to below 20% canopy cover to reduce shading for 60 to 150 feet from the last aspen stem, and large, old conifers will be retained. Downed trees will be placed around the exterior of the aspen patch to block browsing. If hand piling and burning is implemented, the piles will be established at least fifteen feet away from aspen boles to protect from radiant heat damage.

B. **Whitebark Pine Restoration -** Treatment within these units will be by hand only and entail clearing of all small trees within 25 feet of whitebark pine trees to reduce competition and improve tree vigor and protect them in the event of wildfire in the area by changing fire behavior in their immediate area. Large overstory trees will be retained. The remainder of the unit will be treated following the primary prescription described above for that unit (PCT, WFH).

C. **Fish Passage Barrier -** The culvert on Wolf Creek on the 4316800 road has been identified as a fish passage barrier. This culvert would be either removed or replaced to allow for fish passage to high quality habitat above the culvert.

10. Forest Plan Amendment

As a part of the East Face project, the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan) would be amended to include changes to the following sections outlined below. The need for these changes is described under each section below. Refer to each alternative description to determine which sections are included in each alternative and what units are affected.

Section 1: Treatment in Old-growth Below HRV – Forest Plan Amendment

Stand density treatments throughout the project area have been designed to not only reduce fuel loadings to meet the goals of the Cohesive Wildfire Strategy but also to improve tree health and enhance long-term old growth characteristics. Forest Plan standards restrict harvest treatment in LOS that is below HRV without any regard for the location of these stands on the landscape. An HRV analysis of LOS, by potential vegetation group has been completed for this project area and as described in the issues section of this EA, indicates deficiencies in both OFSS and OFMS structure within some potential vegetation groups, with OFSS being nearly non-existent. OFMS structure is more prevalent in the project area. Some stands which were historically OFSS have developed into OFMS due to fire exclusion.

Due to need to reduce ladder fuels in LOS stands located within key strategic fuel reduction corridors in the Anthony Lakes and Rock Creek Bulger Flats wildland urban interfaces and immediately adjacent to 20 miles of private land boundaries along the face of the Elkhorn Mountains, the following modification is made to the Wallowa-Whitman National Forest Land and Resource Management Plan, Regional Forester Amendment #2, for the East Face Vegetation Management Project Planning Area. This modification would facilitate successful development of defensible fuel profile zones (DFPZs), especially in areas adjacent to the private land boundaries and WUIs associated with this project area.

Current Direction: d. Scenario A. If either one or both of the late and old structural (LOS) stages falls below HRV in a particular biophysical environment within a watershed, then there should be no net loss of LOS from that biophysical environment. Do not allow timber sale harvest activities to occur within LOS stages that are below HRV.

Amended Direction: d. Scenario A. If either one or both of the late and old structural (LOS) stages falls below HRV in a particular biophysical environment within a watershed, then there should be no net loss of LOS from that biophysical environment. However, fuel reduction activities (including timber harvest) may occur within LOS stages that are below HRV, if doing so would better meet LOS objectives by moving the landscape towards HRV, achieve fuel reduction objectives within key strategic fuel reduction corridors, and continue to provide LOS for the habitat needs of associated wildlife species.

Treatments include commercial thinning (HTH) of trees less than 21 inches in diameter, reducing levels of standing and down material, thinning and cleaning of small diameter trees, pile and burn, and prescribed burning. Treatments under this amendment would not result in a net loss of old growth, but the amendment would provide for treatments that would maintain old growth habitat as defined by Forest standards and definitions. Old growth habitat is measured by levels of down wood, snags, number of canopy layers and large trees (See Regional Forester's amendment #2 –screens- and Wallowa-Whitman National Forest Recommended Definitions for New Structure Stages per Amendment #2, November 9, 1995).

Trees > 21 inches dbh would not be cut. Treatments would move multi-strata stands towards single-strata stands while maintaining adequate levels of down logs and snags within strategic fuel reduction areas.

Section 2: Treatment in Allocated Old Growth (MA15) - Forest Plan Amendment

Treatment in a portion of the allocated old growth located in T7S, R37E, Section 11 is proposed to provide a continuous fuels reduction treatment along the 73 Road. This allocated old growth area is strategically located on the ridgetop along the 73 road on the southern boundary of the project area and adjacent to a WUI.

The Forest Plan does not address treatment needs that reduce fuels and modify fire behavior in old growth within or in close proximity to this WUI. The Forest Plan does say under Timber at 4-90, "areas allocated to old-growth timber will have no scheduled timber harvest although salvage may occur following catastrophic destruction if a more suitable replacement stand exists." The exception to salvage following catastrophic destruction has little utility since this old growth area is healthy, functioning old growth. The direction prohibiting scheduled timber harvest also has little utility since treatment objectives are fuels reduction and modifying fire behavior not only within the old growth stand but immediately adjacent to this WUI and the Twin Mountain Inventoried Roadless Area. These objectives give little consideration to timber harvest or commercial viability.

Due to the lack of direction from the Forest Plan to provide fuels reduction criteria for entering old growth within or adjacent to this WUI, the ID team with Forest support, recommends that a site specific Forest Plan amendment be included as a component of the proposed action to reduce fuels and modify fire behavior in a portion of the allocated old growth located in T7S, R37E, Section 11.

The following guideline is being added to clarify compatibility and use of fuels reduction treatments in 75 acres of the Management Area 15 area located in T7S, R37E, Section 11:

> **Wildland Urban-Interface Guideline.** Mechanical and non-mechanical fuels reduction is permitted within 75 acres of the allocated old growth stand located in T7S, R37E, Section 11 located immediately adjacent to the Rock Creek/Bulger WUI to meet fuels treatment objectives. Where treatments are applied they shall retain old-growth characteristics and move the treated portion of the stand to OFSS stand structure.

The amendment would allow fuels reduction prescription treatments within this 75 acre portion of allocated old growth. Treatments would include commercial thinning of trees under 21 inches, removing dead standing and down material, whipfelling and cleaning of small diameter trees, handpiling and jackpot burning. Treatments under this amendment would not result in a net loss of old growth, but the amendment would provide for treatments that would maintain old growth habitat as defined by Forest standards and definitions. Old growth habitat is measured by levels of down wood, snags, number of canopy layers and large trees (See Regional Forester's amendment #2 –screens- and Wallowa-Whitman National Forest Recommended Definitions for New Structure Stages per Amendment #2, November 9, 1995).

The treated portion of this area would remain designated as allocated old growth. This amendment would not change the allocation as designated under the Forest Plan and would apply to this project area only. No trees >21 inches would be cut.

Section 3: Treatment in MA6 – Commercial and Non-Commercial Harvest in WUI

Treatment in the backcountry recreation area (MA6) located in the project area is proposed to provide fuels reduction within the Anthony Lakes WUI near the Floodwater Flats Recreation Tract, and the Anthony Lakes campground and ski area.

The Forest Plan does not address treatment needs that reduce fuels and modify fire behavior in areas allocated to MA6 within or in close proximity to the Anthony Lakes WUIs. Due to the lack of direction from the Forest Plan to provide fuels reduction criteria for entering MA6 within or adjacent to the WUI, the ID team with Forest support, recommends that a site specific Forest Plan amendment be included as a component of the proposed action in order to reduce fuels and modify fire behavior in strategic areas to protect recreation facilities and the Floodwater Flat Recreation Tract located in T7S, R36E, Section 7 along NFS road 7300160. These treatments will also introduce heterogeneity into a very homogenous overstocked landscape at growing risk to attack from insect and disease. While the Forest Plan at page 4-69 allows for harvest to prevent the spread of insects on adjacent lands it does not specifically provide for fuel reduction treatments within WUIs.

The following guideline is being added to clarify compatibility and use of fuels reduction treatments in the Management Area 6 area:

> **Wildland Urban-Interface Guideline.** Mechanical and non-mechanical fuels reduction is permitted within a portion of MA6 located within and adjacent to the Anthony Lakes WUI to meet fuels treatment objectives. Treatments to maintain the integrity of the DFPZ would occur every 15-20 years. Where treatments are applied they shall maintain and improve recreation and visual characteristics.

This area would remain designated as MA6. This amendment would not change the allocation as designated under the Forest Plan and would apply to this project only.

11. Road Right-of-Way and Bridge Replacement

The 7312 road is the primary haul route for the East Face project area. Due to weight limitations which will not support log haul on the bridge on the 7312 road over the North Fork of Anthony Creek, the old bridge would be physically removed and a new bridge would be installed.

Right-of-Way (ROW) access would be acquired for 0.37 miles of road 7302 across privately private lands adjacent to the project area in order to facilitate logging and fuel reduction activities. Access is not going to be needed in the long term on 2.17 miles of the private road north of Pilcher Creek Reservoir which accesses forest road 4315952 and a temporary road use permit will be acquired. If the road is needed for public access and future management, easement acquisition will be pursued (refer to Alternative maps in Appendices A-C).

Alternative Descriptions

The following is a brief description of the proposed action and alterative(s) that meet the need for action.

Alternative One

This alternative constitutes the "No Action" required by NEPA. Fuel reduction activities, road work, timber harvest, and white bark pine enhancement opportunities identified in this analysis would be deferred. This alternative forms the baseline for comparison of the action alternatives.

Alternative Two - Proposed Action

This alternative focuses on improving stand health and meeting the goals of the Cohesive Wildfire Strategy (CWS) to restore and maintain landscapes, create fire adapted communities, and improve fire response times. Treatments are designed to manage stocking levels, reduce surface fuel loadings, ladder fuels, and canopy bulk densities in strategic locations throughout the project area. Strategic locations include stands along key roads within the project area; ridge tops, private land interface areas, recreation areas and residences, and along the La Grande Municipal watershed boundary. Strategies for creating fuel reduction areas include the treatments described in the Common Elements Section above. In addition to the elements common to action alternatives described above, the following elements are part of this alternative. The original proposed action was modified slightly in response to public comments during scoping related to opportunities for the use of prescribed fire across boundaries in the Elkhorn Wildlife Area and onto BLM lands. Refer to the map and data tables in Appendix A for specifics.

This alternative responds to key issues for fire behavior, old growth below HRV, economics, forest health and sustainability, landscape connectivity, and road access.

Commercial Fuels Reduction & Vegetation Management Treatments

The following fuels reduction and vegetation management treatments would occur within the project area to address the purposed and need (see also maps in Appendix A):

Table 6 - Commercial Treatment Acre Totals by Silvicultural Prescription for Alternative 2

Prescription	Acres
Commercial thinning - HTH	3,563
Sanitation harvest – HSA	210
Shelterwood Harvest - HSH	318
Partial Removal - HPR	43
Improvement harvest - HIM	2,200
Fuels Harvest - HFU	245
Patch Openings – HPO	143*
Total Commercial Treatment	**6,722**

*Includes HPO treatments in HIM/HPO and HTH/HPO units

Commercial Thinning harvest (HTH) - Affected Units: 1, 3, 12, 19, 22, 33-34, 48, 55-62, 64-65, 68-69, 72, 74-78, 80, 91-92, 94-98, 102-106, 111-112, 115-116, 119-120, 122, 129, 131, 140, 143-145.

Sanitation harvest (HSA) - Affected Units: 2, 20, 128, 133.

Shelterwood harvest (HSH) - Affected Units: 13-14, 21, 39-40, 44, 51, 89, 93, 108, 114.

Partial Removal harvest (HPR) - Affected Units: 4-5, 17.

Improvement harvest (HIM) - Affected Units: 6-11, 15-16, 18, 23-27, 29-30, 32, 35-38, 41-43, 45, 47, 49-50, 52-53, 63, 67, 70-71, 73, 79, 81, 86-88, 99-101, 109-110, 113, 117-118, 121, 123-126, 130, 132, 134, 141-142, 146.

Fuels Harvest (HFU) - Affected Units: 28, 31, 46, 66, 127, 135, 138-139, 147.

Patch Openings (HPO) - Affected Units: 82-85 and portions of 43, 55-57, 59-61, 65, and 146.

Non-Commercial Fuels Reduction & Vegetation Management Treatments

Table 7 - Non-Commercial Treatment Acre Totals for Alternative 2

Prescription	Acres
Pre-Commercial thinning - PCT	3,447
Fuel Reduction by Hand – WFH	5,184
Fuel Reduction Mechanical - WFM	1,745
Fuel Reduction Non-commercial - FFU	0
Total Non-Commercial Treatment Acres	**10,376**

Pre-commercial Thin (PCT) - Affected units are: 304-305, 308-309, 314, 317-321, 323-324, 326-327, 329-334, 337, 339, 341, 345-352, 354, 360, 363, 365, 368, 375-376, 381-382, 385, 387-389, 399, 402-403, 410-411, 413, 416, 418-420, 422-423.

Fuels Reduction Hand Work Only (WFH) - Affected units are: 301-303, 306-307, 310-312, 316, 325, 328, 335-336, 338, 340, 353, 355, 357-359, 361, 366, 369-372, 374, 377-379, 383, 390-393, 395, 397-398, 400-401, 404-409, 414-415.

Fuels Reduction Mechanical (WFM) - Affected units are: 313, 315, 342-343, 356, 362, 364, 367, 373, 380, 384, 386, 394, 396, 412, 417, 421, 424-425,429, 431, 436.

Fuels Blocks - Prescribed Burning

Approximately 6,685 acres of prescribed burning is proposed within the area implemented over the next 10 years. Affected units are: 600 - 617

Table 8 - Prescribed burning block acres for Alternative 2

Prescribed Burning	
Burn Block	**Total Acres**
601	967
602	183
603	1,317
604	514
605	440
606	158
607	658
608	182
609	223
610	513
611	775
612	341
613	152
614	73
615	37
616	39
617	113

Prescribed Burning	
Burn Block	**Total Acres**
Total	**6,685**

Alternative Design Criteria

Riparian habitat conservation area (RHCA) treatments – 991 acres within RHCAs would be treated. Affected units: 301-302, 304-312, 314, 316, 318-320, 326-328, 332-333, 335-336, 353, 355, 357, 359, 366, 368-369, 376-377, 382-383, 387, 392-393, 395, 397, 399, 401, 404, 406-410, 414, 418, 420, 422.

Direct ignition for prescribed fire would occur within RHCAs - Affected burn blocks: 601, 603-607, 610-612.

Scenic Resources Protection – Affected units: 1, 8, 10-12, 15-17, 19, 21-22, 46, 48, 50-51, 55-56, 59-63, 74, 91, 102, 112, 115-116, 119-124, 128, 130-134, 147, 301, 306-307, 311-320, 328-329, 335-336, 341, 353-355, 377-378, 401, 404-410, 413, 431.

Connective Corridor Units – Affected units: 11, 15, 20, 16, 39, 58, 100, 122, 128, 133, 132, 308, 311, 403, 431

Whitebark Pine Restoration – Affected units: 305, 307, 309-313, 315-317, 431.

Removal Systems Summary:

Proposed harvest treatments are estimated to result in removal of approximately 21.9 million board feet of saw and non-saw material using the following yarding systems.

- Skyline based yarding systems 1,094 acres
- Ground based yarding systems 5,295 acres
- Helicopter yarding systems 333 acres

No new permanent road construction is proposed with this project. In addition to regular road maintenance activities on roads which will be used to facilitate harvest activities, approximately 35.5 miles of road reconstruction would be proposed to fix/prevent sediment issues and approximately 53 miles of heavy maintenance to re-open roads which have grown closed.

Approximately 12.62 miles of temporary road construction are proposed to facilitate harvest systems. Approximately half of those miles are on existing wheel tracks on the ground and would require very little in the way of ground disturbance to be used for harvest activities. Temporary roads would be treated after use by implementing some or all of the following activities: installation of erosion control devices, subsoiling to reduce soil compaction, seeding, and blocking or camouflaging roads to discourage further use. 107 miles of currently closed roads will be re-opened to facilitate harvest and fuel reduction activities. In general, currently closed roads opened to facilitate project activities would be reclosed at the conclusion of fuel reduction/harvest activities (refer to the post sale road management plan section below and attached map). If winter logging is done using the 4300, 4300020, 4300095, 4300100, 4315, 4316, 4330, 4350, 7312, 4380 roads, use would be coordinated with the District Recreation Manager to designate an alternative snowmobile route while log haul is occurring.

Forest Plan Amendment

As a part of Alternative 2, Forest Plan Amendment Sections 1-3 (as described in the Common Elements Section) would amend the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan). Refer to tables in Appendix A for treatment prescriptions by unit. Affected units are:

- Section 1 – Treatment in LOS below HRV (97 acres): Units 19, 119, 129, 131.
- Section 2 – Treatment in MA15 (75 acres): Unit 134
- Section 3 – Treatment in MA6 (804 acres) : Units 138, 139, 307, 309-312

Post-Sale Road Management Plan (refer to map in Appendix A):

A road management plan (refer to attached map) has been developed for the East Face project area. In general, the current open road system will remain the same following implementation of the East Face Vegetation Management project with the exception of the roads below which will have the following changes:

- Roads 7312100, 7312140, 7312400 – would be remain open following project implementation because current road densities are well below Forest Plan standards in this area and these roads were identified as not creating any resource damage and currently being used by the public.
- 7312150 road – is a dead end drawbottom road which would be closed to protect water quality.
- All or portions of roads 7320, 7300140, 7315, 4320, 4320150, and 4315800 are closed year round or seasonally and are important access roads within WUI areas which would be closed again following use in this project; however, closure would be with a gate to allow for ease of access during fire suppression activities.
- With the exception of the roads described above, any road currently closed by gate or barricade to be re-opened and used to facilitate harvest/fuel reduction activities would be re-closed at the conclusion of harvest activities within the units they access.
- 31.3 miles of roads identified as either duplicate access or no longer needed on the landscape for resource management and recreation access and would be decommissioned, returned to resource production, and removed from the road system. Many of these have grown in and have not received any use in the last 20 years.

Summary – The following table displays the acres of commercial and non-commercial fuels reduction treatments proposed in each of Priority Treatment Areas:

Priority Treatment Areas	Commercial Treatment Acres	Non-commercial Treatments Acres	Total Acres
Area One	2,844	5,775	8,619
Area Two	3,325	4,531	7,856
Area Three	553	70	623
Total	**6,722**	**10,376**	**17,098**

Alternative 3

Design of this alternative reflects the general purpose of meeting the goals of the Cohesive Wildfire Strategy (CWS); however, it focuses more intently on responding to the to key issues related to retention of old growth, road access, landscape connectivity, and retention of unroaded areas. Alternative 3 was developed to respond to these issues raised during scoping by using the Proposed Action as a base and incorporating the following changes:

Retention of Old Growth habitat:

- No treatments within Allocated Old Growth stands (MA15)
- No commercial logging within any LOS stands below HRV

Retention of Unroaded Areas:

- No treatment within areas inventoried as potential wilderness areas (PWA) – Units 104 and 105.
- Use only non-commercial harvest fuels reduction within the MA6 portion of the Anthony Lakes Wildland Urban Interface (WUI) area.

Road Access:

- No construction of temporary roads
- No reconstruction/use of roads identified as overgrown

Landscape Connectivity:

- No regeneration harvests (HPO or HSH)
- No treatment within connective corridor units

Refer to the map and data tables in Appendix B for specifics.

Commercial Fuels Reduction & Vegetation Management Treatments

The following fuels reduction and vegetation management treatments would occur within the project area to address the purposed and need under this alternative (see also maps in Appendix B):

Table 9 - Commercial Treatment Acre Totals by Silvicultural Prescription for Alternative 3

Prescription	Acres
Commercial thinning - HTH	2,437
Sanitation harvest – HSA	62
Shelterwood Harvest - HSH	0
Partial Removal - HPR	43
Improvement harvest - HIM	1,198
Fuels Harvest - HFU	139
Patch Openings – HPO	0*
Total Commercial Treatment	**3,879**

*HPO prescriptions were dropped from HIM/HPO and HTH/HPO units

Commercial Thinning harvest (HTH) - Affected Units: 1, 12, 22, 33-34, 48, 55-57, 59-61, 68, 72, 74-75, 77-78, 80, 91-92, 94, 96-98, 102-103, 112, 115-116, 143.

Sanitation harvest (HSA) - Affected Units: 2.

Partial Removal harvest (HPR) - Affected Units: 4-5, 17.

Improvement harvest (HIM) - Affected Units: 6-8, 10, 18, 23-27, 29-30, 32, 35, 38, 43, 49-50, 52-53, 63, 67, 70, 73, 79, 81, 101, 109-110, 117, 126, 130, 132, 134, 142.

Fuels Harvest (HFU) - Affected Units: 28, 31, 46, 127, 135, 147.

Non-Commercial Fuels Reduction & Vegetation Management Treatments

Table 10 - Non-Commercial Treatment Acre Totals for Alternative 3

Prescription	Acres
Pre-Commercial thinning - PCT	3,372
Fuel Reduction by Hand – WFH	4,658
Fuel Reduction Mechanical - WFM	1,745
Fuel Reduction Non-commercial - FFU	0
Total Non-Commercial Treatment Acres	**9,775**

Pre-commercial Thin (PCT) - Affected units are: 304-305, 308, 314, 317-321, 323-324, 326-327, 329-334, 337, 339, 341, 345-352, 354, 360, 363, 365, 368, 375-376, 381-382, 385, 387-389, 399, 402-403, 410-411, 413, 416, 418-420, 422-423.

Fuels Reduction Hand Work Only (WFH) - Affected units are: 301-303, 306-307, 312, 316, 325, 328, 335-336, 338, 340, 353, 355, 357-359, 361, 366, 369-372, 374, 377-379, 383, 390-393, 395, 397-398, 400-401, 404-409, 414-415.

Fuels Reduction Mechanical (WFM) - Affected units are: 313, 315, 342-343, 356, 362, 364, 367, 373, 380, 384, 386, 394, 396, 412, 417, 421, 424-425,429, 431, 436.

Fuels Blocks - Prescribed Burning

Approximately 6,043 acres of prescribed burning is proposed within the area implemented over the next 10 years. Deferring commercial and non-commercial pre-treatments in some burn blocks necessitated dropping some burn blocks because fuel loadings would be too high to be able to meet burning objectives. All or portions of burn blocks 605, 612, 614, and 615 were deferred from prescribed burning in this alternative.

Table 11 - Prescribed burning block acres for Alternative 3

Prescribed Burning	
Burn Block	**Total Acres**
601	967
602	183
603	1,317
604	514
605	249
606	158
607	658
608	182
609	223
610	513
611	775
613	152
616	39
617	113
Total	**6,043**

Alternative Design Criteria

Riparian habitat conservation area (RHCA) treatments – 837 acres within RHCAs would be treated. Affected units: 301-302, 304-308, 311-312, 314, 316, 318-320, 326-328, 332-333, 335-336, 353, 355, 357, 359, 366, 368-369, 376-377, 382-383, 387, 392-393, 395, 397, 399, 401, 404, 406-410, 414, 418, 420, 422.

Direct ignition for prescribed fire would occur within RHCAs - Affected burn blocks: 601, 603-607, 610-611.

Scenic Resources Protection – Affected units: 1, 8, 10, 12, 17, 22, 46, 48, 50, 55-56, 59-61, 63, 74, 91, 102, 112, 115-116, 130, 132-134, 147, 301, 306-307, 311-320, 328-329, 335-336, 341, 353-355, 377-378, 401, 404-410, 413, 431.

Whitebark Pine Restoration – Affected units: 305, 307, 310-313, 315-317, 431.

Removal Systems Summary:

Proposed harvest treatments are estimated to result in removal of approximately 12.5 million board feet of saw and non-saw material using the following yarding systems.

- Skyline based yarding systems 416 acres
- Ground based yarding systems 3,239 acres
- Helicopter yarding systems 224 acres

No new permanent road construction is proposed with this project. In addition to regular road maintenance activities on roads which will be used to facilitate harvest activities, approximately 18.2 miles of road reconstruction would be proposed to fix/prevent sediment issues and approximately 39.3 miles of heavy maintenance would be accomplished.

No temporary road construction would be proposed under this alternative. 66.9 miles of currently closed roads would be re-opened to facilitate harvest and fuel reduction activities. In general, currently closed roads opened to facilitate project activities would be reclosed at the conclusion of fuel reduction/harvest activities (refer to the post sale road management plan section below and attached map). If winter logging is done using the 4300, 4300020, 4300095, 4300100, 4315, 4316, 4330, 4350, 7312, 4380 roads, use would be coordinated with the District Recreation Manager to designate an alternative snowmobile route while log haul is occurring.

Forest Plan Amendment

As a part of Alternative 3, only Forest Plan Amendment Section 3 would amend the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan) as follows:

Section 3: Treatment in MA6 – Non-Commercial Fuels Reduction in WUI

Treatment in the backcountry recreation area located in the project area is proposed to provide fuels reduction within the Anthony Lakes WUI near the Floodwater Flats Recreation Tract, and the Anthony Lakes campground and ski area.

The Forest Plan does not address treatment needs that reduce fuels and modify fire behavior in areas allocated to MA6 within or in close proximity to WUIs. The Forest Plan does say under Timber at 4-69, "timber harvest may occur in the event of a catastrophe such as a fire or insect outbreak when doing so would maintain or improve recreation or visual characteristics and meet the landscape management direction for MA6….harvest may also occur when analysis shows timber removal to be necessary to prevent spread of insects onto adjacent lands." The direction prohibiting scheduled timber harvest also has little utility since treatment objectives are fuels reduction and modifying fire behavior. These objectives give little consideration to timber harvest or commercial viability.

Due to the lack of direction from the Forest Plan to provide fuels reduction criteria for entering MA6 within or adjacent to a WUI, the ID team with Forest support, recommends that a site specific non-significant Forest Plan amendment be included as a component of the proposed action in order to reduce fuels and modify fire behavior in strategic areas to protect recreation facilities and the Floodwater Flat Recreation Tract located in T7S, R36E, Section 7 along road 7300160. These treatments will also introduce heterogeneity into a very homogenous overstocked landscape at growing risk to attack from insect and disease.

The following guideline is being added to clarify compatibility and use of fuels reduction treatments in the Management Area 6 area:

> **Wildland Urban-Interface Guideline.** Non-mechanical fuels reduction is permitted within 242 acres of MA6 located within the Anthony Lakes WUI to meet fuels treatment objectives. Treatments to maintain the integrity of the DFPZ would occur every 15-20 years. Where treatments are applied they shall maintain and improve recreation and visual characteristics.

This area would remain designated as MA6. This amendment would not change allocation as designated under the Forest Plan. Affected units are: 307, 311-312.

Post-Sale Road Management Plan (refer to map in Appendix A):

A road management plan (refer to attached map) has been developed for the East Face project area. In general, the current open road system will remain the same following implementation of the East Face Vegetation Management project with the exception of the roads below which will have the following changes:

- Roads 7312100, 7312140, 7312400 – would be remain open following project implementation because current road densities are well below Forest Plan standards in this area and these roads were identified as not creating any resource damage and currently being used by the public.
- 7312150 road – is a dead end drawbottom road which would be closed to protect water quality.
- All or portions of roads 7320, 7300140, 7315, 4320, 4320150, and 4315800 are closed year round or seasonally and are important access roads within WUI areas which would be closed again following use in this project; however, closure would be with a gate to allow for ease of access during fire suppression activities.
- With the exception of the roads described above, any road currently closed by gate or barricade to be re-opened and used to facilitate harvest/fuel reduction activities would be re-closed at the conclusion of harvest activities within the units they access.
- 38.5 miles of roads identified as either duplicate access or no longer needed on the landscape for resource management and recreation access and would be decommissioned, returned to resource production, and removed from the road system. Many of these have grown in and have not received any use in the last 20 years.

Summary – The following table displays the acres of commercial and non-commercial fuels reduction treatments proposed in each of Priority Treatment Areas:

Priority Treatment Areas	Commercial Treatment Acres	Non-commercial Treatments Acres	Total Acres
Area One	1,758	5,600	7,358
Area Two	1,953	4,105	6,058
Area Three	168	70	238
Total	**3,879**	**9,775**	**13,654**

Alternative 4

This alternative was designed to meet CWS goals; however, it focuses the most intensive commercial and non-commercial treatments to reduce surface fuel loadings, ladder fuels, and canopy bulk densities in Priority 1 treatment areas (as described in Common Elements section above). Alternative 4 was developed using the Proposed Action as a base and incorporating the following changes within each Priority Area:

- Priority 1 areas - Treat all commercial and non-commercial units as proposed in the Proposed Action within this area to ensure treatment within wildland urban interface areas, along private land interface areas, and adjacent roadless and wilderness areas.
- Priority 2 areas - Change commercial treatments to non-commercial within all units within Priority area 2 to focus treatments along strategic road systems and ridgetops within the project are but reduce the impacts associated with timber harvest activities on other resources.
- Priority 3 areas – Within this priority area, treatments would be focused on dry potential vegetation groups which would have historically had a more frequent fire regime within them.

Refer to the map and data tables in Appendix B for specifics.

This alternative responds to key issues for fire behavior, old growth below HRV, economics, forest health and sustainability, landscape connectivity, and road access.

In addition to the elements common to action alternatives described above, the follow elements are part of this alternative.

Commercial Fuels Reduction & Vegetation Management Treatments

The following fuels reduction and vegetation management treatments would occur within the project area to address the purposed and need (see also maps in Appendix B):

Table 12 - Commercial Treatment Acre Totals by Silvicultural Prescription for Alternative 4

Prescription	Acres
Commercial thinning - HTH	1,154
Sanitation harvest – HSA	122
Shelterwood Harvest - HSH	120
Partial Removal - HPR	38
Improvement harvest - HIM	1,255
Fuels Harvest - HFU	155
Patch Openings – HPO	9*
Total Commercial Treatment	**2,844**

*Includes HPO treatments in HIM/HPO unit

Commercial Thinning harvest (HTH) - Affected Units: 3, 33, 76-78, 80, 91-92, 94-98, 111, 119-120, 122, 129, 131, 140, 143-144.

Sanitation harvest (HSA) - Affected Units: 128, 133.

Shelterwood harvest (HSH) - Affected Units: 39-40, 93, 108.

Partial Removal harvest (HPR) - Affected Units: 4-5, 17.

Improvement harvest (HIM) - Affected Units: 7, 29-30, 32, 35-38, 41-43, 52-53, 79, 109-110, 117-118, 121, 123-126, 130, 132, 134, 141-142.

Fuels Harvest (HFU) - Affected Units: 28, 31, 127, 135, 138-139.

Patch Openings (HPO) - Affected Units: 43.

Non-Commercial Fuels Reduction & Vegetation Management Treatments

Table 13 - Non-Commercial Treatment Acre Totals for Alternative 4

Prescription	Acres
Pre-Commercial thinning - PCT	6,682
Fuel Reduction by Hand – WFH	5,184
Fuel Reduction Mechanical - WFM	1,700
Fuel Reduction Non-commercial - FFU	90
Total Non-Commercial Treatment Acres	**13,656**

Pre-commercial Thin (PCT) - Affected units are: 1, 8-26, 34, 44-45, 47-51, 55-65, 67-75, 102-103, 112-116, 145, 304-305, 308-309, 314, 317-321, 323-324, 326-327, 329-334, 337, 339, 341, 345-352, 354, 360, 363, 365, 368, 375-376, 381-382, 385, 387-389, 399, 402-403, 410-411, 413, 416, 418-420, 422-423.

Fuels Reduction Hand Work Only (WFH) - Affected units are: 301-303, 306-307, 310-312, 316, 325, 328, 335-336, 338, 340, 353, 355, 357-359, 361, 366, 369-372, 374, 377-379, 383, 390-393, 395, 397-398, 400-401, 404-409, 414-415.

Fuels Reduction Mechanical (WFM) - Affected units are: 313, 315, 342-343, 356, 362, 364, 367, 373, 380, 384, 386, 394, 396, 412, 417, 421, 425,429, 431, 436.

Fuels Reduction Non-commercial (FFU) - Affected units are: 46, 66, and 147.

Fuels Blocks - Prescribed Burning

Approximately 6,643 acres of prescribed burning is proposed within the area implemented over the next 10 years. Deferring commercial and non-commercial pre-treatments in some burn blocks necessitated dropping some burn blocks because fuel loadings would be too high to be able to meet burning objectives. All or portions of burn blocks 613 and 615 were deferred from prescribed burning in this alternative.

Table 14 - Prescribed burning block acres for Alternative 4

Prescribed Burning	
Burn Block	**Total Acres**
601	967
602	183
603	1,317
604	514
605	440
606	158
607	658
608	182
609	223
610	513
611	775

Prescribed Burning	
Burn Block	**Total Acres**
612	341
613	147
614	73
616	39
617	113
Total	**6,685**

Alternative Design Criteria

Riparian habitat conservation area (RHCA) treatments – 991 acres within RHCAs would be treated. Affected units: 301-302, 304-312, 314, 316, 318-320, 326-328, 332-333, 335-336, 353, 355, 357, 359, 366, 368-369, 376-377, 382-383, 387, 392-393, 395, 397, 399, 401, 404, 406-410, 414, 418, 420, 422.

Direct ignition for prescribed fire would occur within RHCAs - Affected burn blocks: 601, 603-607, 610-612.

Scenic Resources Protection – Affected units: 1, 8, 10-12, 15-17, 19, 21-22, 46, 48, 50-51, 55-56, 59-63, 74, 91, 102, 112, 115-116, 119-124, 128, 130-134, 147, 301, 306-307, 311-320, 328-329, 335-336, 341, 353-355, 377-378, 401, 404-410, 413, 431.

Connective Corridor Units – Affected units: 11, 15, 16, 20, 39, 58, 122, 128, 132, 133, 308, 311, 403, 431

Whitebark Pine Restoration – Affected units: 305, 307, 309-313, 315-317, 431.

Removal Systems Summary:

Proposed harvest treatments are estimated to result in removal of approximately 9.0 million board feet of saw and non-saw material using the following yarding systems.

- Skyline based yarding systems 419 acres
- Ground based yarding systems 2,092 acres
- Helicopter yarding systems 333 acres

No new permanent road construction is proposed with this project. In addition to regular road maintenance activities on roads which will be used to facilitate harvest activities, approximately 16.5 miles of road reconstruction would be proposed to fix/prevent sediment issues and approximately 27.8 miles of heavy maintenance to re-open roads which have grown closed.

Approximately 2.62 miles of temporary road construction are proposed to facilitate harvest systems. Approximately 0.67 miles are on existing wheel tracks on the ground and would require very little in the way of ground disturbance to be used for harvest activities. The remaining 1.95 miles would be new construct. Temporary roads would be treated after use by implementing some or all of the following activities: installation of erosion control devices, subsoiling to reduce soil compaction, seeding, and blocking or camouflaging roads to discourage further use. 38.6 miles of currently closed roads will be re-opened to facilitate harvest and fuel reduction activities. In general, currently closed roads opened to facilitate project activities would be reclosed at the conclusion of fuel reduction/harvest activities (refer to the post sale road management plan section below and map in Appendix B). If winter logging is done using the 4300, 4300020, 4300095, 4300100, 4315, 4316, 4330, 4350, 7312, 4380 roads, use would be coordinated with the District Recreation Manager to designate an alternative snowmobile route while log haul is occurring.

Forest Plan Amendment

As a part of Alternative 4, Forest Plan Amendment Sections 1-3 (as described in the Common Elements Section) would amend the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan). Refer to tables in Appendix C for treatment prescriptions by unit. Affected units are:

- Section 1 – Treatment in LOS below HRV (62 acres): Units 119, 129, 131.
- Section 2 – Treatment in MA15 (75 acres): Unit 134
- Section 3 – Treatment in MA6 (804 acres) : Units 138, 139, 307, 309-312

Post-Sale Road Management Plan (refer to map in Appendix A):

A road management plan (refer to map in Appendix A) has been developed for the East Face project area. In general, the current open road system will remain the same following implementation of the East Face Vegetation Management project with the exception of the roads below which will have the following changes:

- Roads 7312100, 7312140, 7312400 – would be remain open following project implementation because current road densities are well below Forest Plan standards in this area and these roads were identified as not creating any resource damage and currently being used by the public.
- 7312150 road – is a dead end drawbottom road which would be closed to protect water quality.
- All or portions of roads 7320, 7300140, 7315, 4320, 4320150, and 4315800 are closed year round or seasonally and are important access roads within WUI areas which would be closed again following use in this project; however, closure would be with a gate to allow for ease of access during fire suppression activities.
- With the exception of the roads described above, any road currently closed by gate or barricade to be re-opened and used to facilitate harvest/fuel reduction activities would be re-closed at the conclusion of harvest activities within the units they access.
- 31.3 miles of roads identified as either duplicate access or no longer needed on the landscape for resource management and recreation access and would be decommissioned, returned to resource production, and removed from the road system. Many of these have grown in and have not received any use in the last 20 years.

Summary – The following table displays the acres of commercial and non-commercial fuels reduction treatments proposed in each of Priority Treatment Areas:

Priority Treatment Areas	Commercial Treatment Acres	Non-commercial Treatments Acres	Total Acres
Area One	2,844	5,775	8,619
Area Two	0	7,856	7,856
Area Three	0	25	25
Total	**2,844**	**13,656**	**16,500**

Alternative 5

This alternative focuses on optimizing commercial removal of woody materials while meeting the goals of the CWS. In addition to the treatments designed to reduce surface fuel loadings, ladder fuels, and canopy bulk densities in strategic locations throughout the project area, additional overstocked acres within Priority Areas 2 and 3 and biomass removal opportunities were also considered for treatment under this alternative.

The elements common to action alternatives described previously and the follow elements are also part of this alternative:

- Non-commercial fuel reduction treatment units (PCT, WFH) on less than 35% slope, within a half mile of road access were also analyzed for biomass removal opportunities (PCT-Bio and WFH-Bio). This market is highly variable and commercial removal of this product is largely based on its current market value. Because this is a rapidly developing market and new techniques for the removal, processing, and use of wood fiber are being developed every day, opportunities for utilizing this product are being analyzed in this alternative to maintain options for commercial removal in the future. Note: if there is no market for the biomass within these units, the PCT and WFH would still occur and slash treatments would be the same as those described under Alternative 2 for each unit.

- To mitigate the additional miles of roads to be opened and commercial harvest activities to be undertaken under this alternative, the following adjustments to the timing and methods of road and area closures have been made in the Post Sale Road Management Plan:

    - Roads that had grown closed which were reopened for this alternative would be promulgated and signed restricting motor vehicle use once the road has been closed. These promulgations will remain in place for the next 5 years.
    - The closure periods for the Clear Creek and Indian-Gorham Cooperative Closure areas will be extended to include 3 days prior to archery season to the end of second rifle bull elk season.

This alternative responds to key issues for fire behavior, old growth below HRV, economics, forest health and sustainability, landscape connectivity, and road access.

Refer to the map and data tables in Appendix C for specifics.

Commercial Fuels Reduction & Vegetation Management Treatments

The following fuels reduction and vegetation management treatments would occur within the project area to address the purposed and need (see also maps in Appendix C):

Table 15 - Commercial Treatment Acre Totals by Silvicultural Prescription for Alternative 5

Prescription	Acres
Commercial thinning - HTH	3,816
Sanitation harvest – HSA	210
Shelterwood Harvest - HSH	318
Partial Removal - HPR	43
Improvement harvest - HIM	2,886
Fuels Harvest - HFU	245
Patch Openings – HPO	143*
Biomass Removal – WFH-Bio	391
Biomass Removal – PCT-Bio	2,169
Total Commercial Treatment	**10,221**

*Includes HPO treatments in HIM/HPO and HTH/HPO units

Commercial Thinning harvest (HTH) - Affected Units: 1, 3, 12, 19, 22, 33-34, 48, 55-62, 64-65, 68-69, 72, 74-78, 80, 91-92, 94-98, 102-106, 111-112, 115-116, 119-120, 122, 129, 131, 140, 143-145, 154.

Sanitation harvest (HSA) - Affected Units: 2, 20, 128, 133.

Shelterwood harvest (HSH) - Affected Units: 13-14, 21, 39-40, 44, 51, 89, 93, 108, 114.

Partial Removal harvest (HPR) - Affected Units: 4-5, 17.

Improvement harvest (HIM) - Affected Units: 6-11, 15-16, 18, 23-27, 29-30, 32, 35-38, 41-43, 45, 47, 49-50, 52-53, 63, 67, 70-71, 73, 79, 81, 86-88, 99-101, 109-110, 113, 117-118, 121, 123-126, 130, 132, 134, 141-142, 146, 148-153, 155-165.

Fuels Harvest (HFU) - Affected Units: 28, 31, 46, 66, 127, 135, 138-139, 147.

Patch Openings (HPO) - Affected Units: 82-85 and portions of 43, 55-57, 59-61, 65, and 146.

PCT Biomass Removal (PCT-Bio) - Affected Units: 304-305, 308-309, 317-320, 332-333, 337, 354, 365, 368, 375A, 376A, 381, 399, 402-403, 422.

WFH Biomass Removal (WFH-Bio) - Affected Units: 302-303, 328, 340, 371, 378, 383.

Non-Commercial Fuels Reduction & Vegetation Management Treatments

Table 16 - Non-Commercial Treatment Acre Totals for Alternative 5

Prescription	Acres
Pre-Commercial thinning - PCT	1,277
Fuel Reduction by Hand – WFH	4,793
Fuel Reduction Mechanical - WFM	1,745
Fuel Reduction Non-commercial - FFU	0
Total Non-Commercial Treatment Acres	**7,815**

Pre-commercial Thin (PCT) - Affected units are: 314, 321, 323-324, 326-327, 329-331, 334, 339, 341, 345-352, 360, 363, 375-376, 382, 385, 387-389, 410-411, 413, 416, 418-420, 423.

Fuels Reduction Hand Work Only (WFH) - Affected units are: 301, 306-307, 310-312, 316, 325, 335-336, 338, 353, 355, 357-359, 361, 366, 369-370, 372, 374, 377, 379, 390-393, 395, 397-398, 400-401, 404-409, 414-415.

Fuels Reduction Mechanical (WFM) - Affected units are: 313, 315, 342-343, 356, 362, 364, 367, 373, 380, 384, 386, 394, 396, 412, 417, 421, 424-425,429, 431, 436.

Fuels Blocks - Prescribed Burning

Approximately 6,685 acres of prescribed burning is proposed within the area implemented over the next 10 years. Affected units are: 600 - 617

Table 17 - Prescribed burning block acres for Alternative 5

Prescribed Burning	
Burn Block	**Total Acres**
601	967
602	183
603	1,317
604	514
605	440
606	158
607	658
608	182
609	223
610	513
611	775
612	341
613	152
614	73
615	37
616	39
617	113
Total	**6,685**

Alternative Design Criteria

Riparian habitat conservation area (RHCA) treatments – 792 acres within RHCAs would be treated. Affected units: 301, 306-307, 310-312, 314, 316, 326-327, 335-336, 353, 355, 357, 359, 366, 369, 376-377, 382, 387, 392-393, 395, 397, 401, 404, 406-410, 414, 418, 420.

- If biomass is not removed, the following units may still receive RHCA treatments – 302, 304-305, 308-309, 318-320, 328, 332-333, 368, 376A, 383, 399, 422.

Direct ignition for prescribed fire would occur within RHCAs - Affected burn blocks: 601, 603-607, 610-612.

Scenic Resources Protection – Affected units: 1, 8, 10-12, 15-17, 19, 21-22, 46, 48, 50-51, 55-56, 59-63, 74, 91, 102, 112, 115-116, 119-124, 128, 130-134, 147, 301, 306-307, 311-320, 328-329, 335-336, 341, 353-355, 377-378, 401, 404-410, 413, 431.

Connective Corridor Units – Affected units: 11, 15, 20, 16, 39, 58, 100, 122, 128, 133, 132, 308, 311, 403, 431

Whitebark Pine Restoration – Affected units: 307, 310-313, 315-316, 431.

Removal Systems Summary:

Proposed harvest treatments are estimated to result in removal of approximately 26.3 million board feet of saw and non-saw material using the following yarding systems.

- Skyline based yarding systems 1,450 acres
- Ground based yarding systems 8,350 acres
- Helicopter yarding systems 421 acres

No new permanent road construction is proposed with this project. In addition to regular road maintenance activities on roads which will be used to facilitate harvest activities, approximately

61.6 miles of road reconstruction would be proposed to fix/prevent sediment issues and approximately 42.4 miles of heavy maintenance to re-open roads which have grown closed.

Approximately 14.71 miles of temporary road construction are proposed to facilitate harvest systems. Approximately 6.57 miles are on existing wheel tracks on the ground and would require very little in the way of ground disturbance to be used for harvest activities and 8.14 miles would be new construction. Temporary roads would be treated after use by implementing some or all of the following activities: installation of erosion control devices, subsoiling to reduce soil compaction, seeding, and blocking or camouflaging roads to discourage further use. 122.7 miles of currently closed roads will be re-opened to facilitate harvest and fuel reduction activities. In general, currently closed roads opened to facilitate project activities would be reclosed at the conclusion of fuel reduction/harvest activities (refer to the post sale road management plan section below and attached map). If winter logging is done using the 4300, 4300020, 4300095, 4300100, 4315, 4316, 4330, 4350, 7312, 4380 roads, use would be coordinated with the District Recreation Manager to designate an alternative snowmobile route while log haul is occurring.

Forest Plan Amendment

As a part of Alternative 5, Forest Plan Amendment Sections 1-3 (as described in the Common Elements Section) would amend the Wallowa-Whitman National Forest Land and Resource Management Plan (Forest Plan). Refer to tables in Appendix C for treatment prescriptions by unit. Affected units are:

- Section 1 – Treatment in LOS below HRV (97 acres): Units 19, 119, 129, 131.
- Section 2 – Treatment in MA15 (75 acres): Unit 134
- Section 3 – Treatment in MA6 (804 acres) : Units 138, 139, 307, 309-312

Post-Sale Road Management Plan (refer to map in Appendix A):

A road management plan has been developed for the East Face project area. In general, the current open road system will remain the same following implementation of the East Face Vegetation Management project with the exception of the roads below which will have the following changes:

- Roads 7312100, 7312140, 7312400 – would be remain open following project implementation because current road densities are well below Forest Plan standards in this area and these roads were identified as not creating any resource damage and currently being used by the public.
- 7312150 road – is a dead end drawbottom road which would be closed to protect water quality.
- All or portions of roads 7320, 7300140, 7315, 4320, 4320150, and 4315800 are closed year round or seasonally and are important access roads within WUI areas which would be closed again following use in this project; however, closure would be with a gate to allow for ease of access during fire suppression activities.
- With the exception of the roads described above, any road currently closed by gate or barricade to be re-opened and used to facilitate harvest/fuel reduction activities would be re-closed at the conclusion of harvest activities within the units they access.
- 31.3 miles of roads identified as either duplicate access or no longer needed on the landscape for resource management and recreation access and would be decommissioned, returned to resource production, and removed from the road system. Many of these have grown in and have not received any use in the last 20 years.

- The closure periods for the Clear Creek and Indian-Gorham Cooperative Closure areas will be extended to include 3 days prior to archery season to the end of second rifle bull elk season.

Summary – The following table displays the acres of commercial and non-commercial fuels reduction treatments proposed in each of Priority Treatment Areas:

Priority Treatment Areas	Commercial Treatment Acres	Non-commercial Treatments Acres	Total Acres
Area One	4,012	4,674	8,686
Area Two	5,308	3,071	8,379
Area Three	901	70	971
Total	**10,221**	**7,815**	**18,036**

Management Requirements, Constraints and Mitigation Measures

The following items are included in all action alternatives, unless otherwise noted, and provide the measures necessary to keep project impacts at acceptable levels. These items would be applied to the proposal as it is implemented on the ground. Unless specifically identified as a mitigation measure, the following are considered either management requirements or constraints.

A) Soil Quality Mitigation Measures

The mitigating measures listed below will be implemented to meet the standards and guidelines in the Wallowa-Whitman LRMP. Best management practices (BMPs) are forest management practices designed to prevent the degradation of forest lands and water quality during and after timber harvest. Forestry BMPs have been shown to be effective at controlling sediment, erosion, and nutrients from forest management activities (Lynch and Corbett 1990; Stuart and Edwards 2006). Table 18 describes unit specific mitigations for individual units. These mitigations are expected to reduce accumulated DSC's due to compaction and displacement on soils with low bulk densities or units where accumulated DSC's exceed 20% within the project unit.

Table 18 –Unit Specific Soils Mitigations

Mitigation	Affected Units
1. Cut to Length (Forwarder) or subsoil return trails required. High Compaction and erodibility potential of soils.	2,4,6,7,8,12-18,21,25,27,29-34,42-44,46-53,55-57,59-67,70-73,77,79,80, 82-86,91-95,97,98,104-106,110,114,115,117,119-121,123,125-129,131, 138,139,142,143,145-147,149,154,163-165
2. Mastication only – No grapple piling. To maintain soil cover following treatment and reduce expected displacement from grapple piling	7,10,11,12,14,17,24,26,29,33,35,56,58,69,71,77,78,80,82,87,91,103,111, 112,115,117,119,121,124,126,129,130,131,139,142,145,148,150,151,152, 153,154,156,157,159,162
3. Subsoil main skid trails and landings. To reduce accumulated compaction.	83,115,123,128
4. Hand piling only. To reduce expected displacement from mechanical fuels treatment and machine pile burning.	83,123,128

Region 6 Soil Quality standards and the WW LRMP require projects to:

Minimize detrimental soil conditions with total acreage impacted (compaction, puddling, displacement, and severe burning) not to exceed 20 percent of the total acreage within the project area (individual unit) including landings and system roads.

The following guidelines from The Watershed Management Practices Guide for Achieving Soil and Water Objectives for the Wallowa-Whitman National Forest (Hauter and Harkenrider 1988) or more recent publications (Han 2005 and Flatten 2002) and are applicable to this project:

Skid trail spacing and location - Well placed, existing skid trails will be used as much as possible. Mechanical fuels treatment following harvest will use existing skid trails to access treatment areas (all mechanical fuels reduction units).

Soil Moisture - Limit equipment operations to dry (<15-20% soil moisture) (Han, 2005) or frozen/snow covered conditions (four inches of frost or a minimum of 12 inches of snow) (Flatten 2002). Allowing skidding outside of these conditions increases compaction and puddling potential and makes mitigation by subsoiling/scarifying less effective. Operations outside of these conditions should be suspended both on and off trails.

Subsoiling and Scarification

Skid trails and landings will be evaluated for the need for subsoiling or scarification following treatment by the sale administrator and district watershed personnel to maintain site productivity based on soil depth and characteristics.

Units with high soil compaction potential (see table 18) where material is removed using tracked/rubber tires equipment versus forwarders will require subsoiling of return trails to reduce compaction and maintain soil productivity

Sufficient woody material will be left to maintain long term site productivity. This recommendation specifies a minimum of 10 tons per acre of woody material greater than 3 inches in diameter.

Where subsoiling is required, reclamation to improve soil productivity and reduce surface erosion will include:

1) Subsoil to a depth of 20-24 inches on multiple pass skid trails and all landings.

   Equipment to complete subsoiling may include:

   a) Use of a winged ripper with triggered tines to allow for more effective subsoiling in stony soil. Discontinue subsoiling where large rocks are continually brought to the soil surface, or operate with the shoes at a shallower depth (15 inches).
   b) Use of a tracked excavator with subsoiling tines.
2) Scattering of organic matter to provide a minimum of 50% effective ground cover.
3) Seeding with native seed to facilitate vegetation recovery

Where subsoiling is not required, reclamation to improve soil productivity and reduce surface erosion on all skid trails and landings will include:

1) Scattering of organic matter to provide a minimum of 50% effective ground cover.
2) Seeding with native seed to facilitate vegetation recovery

Water Bars-Erosion

Construct water bars on skid trails and mechanical firelines where soil disturbance is evident (and at the direction of the sale administrator and district watershed personnel), using the spacing guide below:

Gradient	Spacing
Under 20 %	80 ft.
20 - 39 %	40 ft.
Greater than 40 %	25 ft.

Construct waterbars on all temporary roads per standard gradient-related spacing guidelines (see Hauter & Harkenrider. WWNF, 1988, p. 47).

Construct waterbars on erosion-sensitive sections of roads, where pre-project erosion has and will continue to damage the road surface.

Seed roads, landings, and skid trails after logging is completed, as needed, with site-specific seed mix, for erosion control.

B) Water Quality

1. Water Quality Standards

Meet (or show progress toward meeting) water quality standards for Waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41) through project design, application and monitoring of best management practices (BMPs) as defined in the Code of Federal Regulations [40CFR 130.2(m)]. BMPs are used for various situations encountered during layout and administration of the timber sale contract and other activities. BMPs area listed in several sections of these constraints, including the "Logging and Sale Design" section, and in other documents, including the Wallowa-Whitman Watershed Management Practices Handbook, which is on file at the La Grande Ranger District.

2. Erosion Control Mitigation Methods

Highly disturbed areas (which may include: skid trails, roads, landings, road cuts and fills, etc.) will be seeded with a mix of native species, or a non-native species mix approved by the District Diverse Species Program (contact program coordinator for the exact species mix and seeding schedule). Non-native species may include one fast germinating annual grass species to provide immediate ground cover that facilitates establishment of native species. Seed application rates will be adjusted, as needed, to compensate for the broadcast method of application, and to generate vegetation densities adequate to provide a deterrent to noxious weed invasion.

Seed will be certified weed free, per the Wallowa-Whitman Integrated Noxious Weed Management Plan protocol.

Erosion control measures will be taken on all skid trails and temporary roads as needed. Spacing of waterbars will be determined by on the ground conditions and guidelines stated in the Sale Administration Handbook.

Slash and soil material may be left in the trail to divert water, or the subsoiling can be done to provide lead-off drainage from the trails.

C) Riparian Habitat and Fisheries Mitigation Measures

RHCAs were delineated along all riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems. RHCAs 1) influence the delivery of sediment, organic matter, and woody debris to streams, 2) provide root strength for bank and channel stability, 3) shade the stream, and 4) protect floodplains and water quality.

The following INFISH RHCA widths described below are minimum widths to be applied in all treatment units. With the exception of site specific RHCA treatments within the RHCAs described under each action alternative, the remainder of the units will have no activity within these RHCAs:

1) *Fish Bearing Streams* – No harvest 300 feet on either side of the flood plain.
2) *Permanently Flowing Non-Fish Bearing Streams* – No harvest 150 feet on either side of the flood plain.
3) *Ponds, Lakes, Reservoirs, and Wetlands greater than 1 acre* – No harvest 150 feet from the edge of the wet area.
4) *Seasonally Flowing or Intermittent Streams, Wetlands less than 1 acre, landslide, and landslide-prone areas* - No harvest 100 feet on either side of the flood plain, no harvest within the extent of landslides and landslide-prone areas.

In ephemeral draws, trees will be left at a minimum of two large trees per 100 feet of draw bottom for future down woody material recruitment. All bank stabilizing, hardwood, and non-merchantable trees will be left.

Layout and marking of treatment units with treatments within the RHCAs will be done in conjunction with the watershed specialist identified for the project.

D) Wildlife

1) USFS Down Woody Material (for wildlife and soils) Mitigation Measures

Where material is available, all treatment units (harvest and prescribed burn) will exceed the minimum levels for down woody material described in the table below for each species.

Table 19 - Minimum pieces of large down dead wood.

SPECIES	PIECES PER AC	PIECE LENGTH AND DIAMETER SMALL END Diameter	Min Length	TOTAL LINEAL LENGTH
Ponderosa Pine	3-6	12”	6ft	20-40 ft
Mixed Conifer	15-20	12”	6ft	100-140 ft
Lodgepole pine	15-20	8”	6ft	120-160 ft

The above pieces per acre are the minimums required by the Forest Plan for wildlife and would be used in the appropriate contract provision; it is desirable to meet the following tons/acre of coarse woody material for soil productivity after harvest/burn operations:

Table 20 - Desired requirements for woody material.

TONS PER ACRE	PLANT ASSOCIATION
5-10	Douglas-fir/spirea, Douglas-fir/elk sedge, Douglas-fir/pinegrass, Grand fir/pinegrass, Ponderosa pine/pinegrass, ponderosa pine/elk sedge, ponderosa pine/snowberry
7-15	Grand fir/twinflower, grand fir/huckleberry, grand fir/spirea

Coarse wood material includes all diameter classes. The large (>12") snags and logs should be protected during all phases of the project including prescribed burning.

2) BLM Down Wood Guidelines:

Hot/dry Forest - retain at least 3 large (greater than 12 inches dbh, greater than 7 feet in length) down logs per acres.

Warm/dry Forest – retain at least 5 large down logs per acre.

3) USFS Green Tree Replacements (GTRs) Mitigation Measures

In addition to the guidelines for logs and snags, sufficient green trees of adequate size would be retained in harvest units to provide replacements for snags and logs through time. Generally GTRs need to be retained at a rate of 25-45 trees per acre, depending on the PVG. All harvest prescriptions in the East Face project would retain GTRs within or above this range.

4) USFS Raptors

Active raptor nest sites found during field reconnaissance for this project will be protected during project activities. If active raptor nests are located during layout, marking, or project activities, appropriate protection measures will be prescribed as described in the Wildlife Inventory document in the project file.

5) BLM Raptors

Active raptor nest sites found during field reconnaissance for this project will be protected during project activities using the standards from the 1989 BLM Resource Management Plan. If active raptor nests are located during layout, marking, or project activities, appropriate protection measures will be prescribed as described in the 1989 BLM Resource Management Plan.

6) *Sensitive Habitats Mitigation Measures*

Plant communities adjacent to sensitive/unique habitats will be protected by maintaining vegetative structure characteristic of the edge inherent to these areas. These areas include cliffs, caves, talus, natural openings, and meadows. No harvest buffers, feathered buffers, or retention of higher basal area will be used to maintain the context of these features.

Buffer widths for sensitive habitats will be at least 100 feet, possibly more on some habitats. The degree of activity allowed within these buffers will vary depending on the type of sensitive habitat. Natural openings will generally not receive a buffer but will have prescription modifications to retain basal areas in the upper half of the management zone to maintain the integrity of the inherent edge for these areas.

Grassy scabs and meadows will not be used as locations for landings or skid trails unless no other location is practical. In those situations where landings are necessary, using the edge of these openings is preferred.

7) Big Game Winter Range

Logging operations will be conducted outside the period between December 15 through April 30 in the following units:

Affected Units:
Alternative 2: 73-74, 76-80
Alternative 3: 73-74, 77-80
Alternative 4: 76-80
Alternative 5: 73-74, 76-80

Waivers to operate during this time period may be requested and will be evaluated on a case by case basis by the District Ranger.

8) Management Indicator and Neotropical Migratory Species

If management indicator species, other than those protected by the design criteria and specifications or the stream buffers discussed earlier, are discovered in any units programmed for prescribed burning the following protective measures could be applied either separately or in combination to reduce possible impacts to snags with nest cavities, and to protect other nest sites during burning: a) fuel distribution (pull back) around snags, b) varied lighting techniques, c) fall burning, d) deferred burning until after the unit is no longer being used during the reproductive period.

9) Diameter Harvest Limits

USFS limits – No live trees greater than or equal to 21 inches dbh will be cut unless they create a safety hazard during logging operations.

BLM limits – Logging design and restrictions will comply with the 1989 BLM Resource Management Plan requirements.

E) Fuels and Smoke Management

Smoke Management Mitigation Measures:

Prescribed burning activities are coordinated with the Oregon Department Forestry Smoke Management Division to assure that all air quality standards for personal health are met. Visual quality standards will be protected in the North Fork John Day and Eagle Cap Wilderness areas during the peak recreational use period of July 1 through September 15. These actions respond to the non-key issue of air quality. All smoke generating project activities will comply with the Clean Air Act.

RHCA Burning Mitigation Measure Procedures:

With the exception of the burn blocks where direct ignition would be permitted during prescribed burning (as described under the Common elements and Alternatives), there will be no direct ignition within INFISH RHCAs for the remainder of the burn blocks, fire will be allowed to back into RHCAs. Direct ignition will be prohibited within 300’ of class I streams, within 150 feet of class III streams, and within 100 feet of class IV streams in all RHCAs not within the excepted burn blocks.

Prescribed fire line will be kept to a minimum inside RHCAs. Brushline (no mineral soil exposed) will be constructed if necessary within RHCAs to keep fires from burning riparian vegetation.

Fisheries and watershed personnel will be notified prior to burning near RHCAs.

Prescribed Burn Units:

Prescribed burning in units that have been mechanically treated may be delayed 2-3 years after the completion of the mechanical treatment to allow the stand to recover from thinning induced stress. This decision will be coordinated with the project Silviculturist prior to any planned ignitions.

Prescriptions on Warm/Dry sites (open pine with grass understory) will limit burn effects to the low-severity burn class which means less than 17% high severity plus moderate severity will be allowed on treated grounds.

No direct ignition will occur immediately adjacent to large down logs or large snags.

Water sources needed during prescribed fire operations will consist of temporary sumps. Sites to be identified at a later date will be constrained by the following:

a) Locate site to minimize washout and erosion potential.
b) Springs and elk wallows will be avoided.
c) Avoidance of potential habitat of PETS plant species.

F) Logging and Sale Design

The sale area boundary will be the project area boundary as described under Project Area Description, section I of this EA and identified on alternative maps in the appendix.

All units with ponderosa pine listed as one of the principal conifer species shall be cut between July 1st and December 1st to mitigate for *Ips* bark beetle impacts.

Trees selected for retention under the Tree Improvement Program will be protected during project activities.

Snowtel and snow survey sites will have a 200' no treatment/no activity buffer around each site. Affected units are: 124, 307, and 365. Layout and treatment within these units will be coordinated with the District Recreation Specialist.

No trees used as anchor trees along a fence line shall be marked for harvest.

Slash piles will not be constructed or burned on scablands.

In order to protect sensitive plant species the following units will be coordinated with the District Botanist and will have areas designated to protect (ATP) during layout and implementation on the contract maps. Affected Units: 45, 55, 59, 60, 61, 62, 63, 82, 83, 84, 85, 90, 98, 112, 138, 146, 328, and 414.

Soil and Water Mitigations:

Generally, ground-based yarding will not occur on ground steeper than 35%. Ground-based yarding on slopes over 35% and greater than 200 feet distance will be identified during pre-sale activity (layout and marking) and approved by the Forest Service Representative/Sale Administrator and district hydrologist/fisheries biologist.

Short, steep areas in tractor ground (up to 200 feet and 50% slope) should require winch lines on all skidding equipment operating on those slopes or use of forwarders which provide full suspension of logs during skidding/yarding.

Skid trails will not be located in ephemeral drainage bottoms and will not cross ephemeral draws on an average of more than once every 200 feet of linear distance.

Designated skid trails will be pre-approved in advance of felling operations by the Forest Service Representative or Sale Administrator to minimize detrimental soil impacts. A unit-by-unit evaluation of detrimental soil conditions will be made in sensitive units upon completion of logging activities. Where detrimental soil impacts exceed twenty percent (20%) of the total acreage within the project area, including landings and system roads, restoration treatments will be considered. Detrimental soil conditions include compaction, puddling, displacement, and severe burning, surface erosion and mass wasting.

Recommended average minimum skid trail spacing for ground-based equipment is 60 feet, center to center for mechanized harvesting, and 80-100 feet for conventional hand felled trees. Require directional felling to minimize soil disturbance during skidding operations. Recommended minimum skyline corridor spacing is 150 feet, center to center, to minimize ground disturbance and protect residual trees. See Soil Quality section.

The normal operating season for the analysis area is July 1 to October 31.

Utilize existing user built roads where possible to avoid previously undisturbed soil when designating temporary road or skid trail locations.

To prevent road damage and maintain water quality, road use will be restricted to dry or frozen conditions. If road use is approved outside the normal operating season, drainage structure will be kept in a functional condition, and daily operations will be managed to minimize sediment transport from roads. Operations will cease when roads turn muddy and/or rutting occurs, resulting in sediment transportation.

Drainage structures will be installed and maintained on all open roads within RHCAs, using spacing guides listed in the Watershed Management Practices Handbook.

Road maintenance will maintain existing drainage features. Post-haul maintenance will protect the road surfaces during future periods of inactivity and may require construction of additional drainage features. Cross drains will not discharge onto erodible slopes or directly into stream channels, including ephemeral drainages.

G) Range Mitigation Measures

Allotment boundary fences and other improvements damaged must be repaired to their functional condition immediately. Any damage occurring to existing range improvements should be reported to the District range manager and/or private landowner. All range improvements will be protected during prescribed burning activities. If damaged they will be repaired as discussed above.

H) Proposed, Endangered, Threatened, and Sensitive Species (PETS)

Biological evaluations and/or assessments have been completed for plants, fish, and wildlife PETS species. Contract provisions will be included to provide for the protection of areas where PETS occur and for those that may be discovered in the area during the contract period.

The following specific units contain sensitive plant species or habitat and will have layout and implementation coordinated with the District Botanist and have a designation of an "Area To Protect" (ATP) on all project and contract maps.   Specific units are identified below.

East Face Units - To Be Protected Through Designation of ATPs:
Timber Harvest Treatment Units (known *Botrychium* sites): 45, 55, 59, 98, 138, 139 and 146
Non-Commercial Treatment Units: 307, 308, 310, 311 312, and 328
Timber Harvest Treatment Units (*Botrychium* habitat): 60, 61, 62, 63, 82, 83, 84, 85, 89, and 112.
Temporary Roads : T-01, T-03, T-04, T–06, T-07, T-08, T-10, T-11 and T-13
Treatment Units (as identified above) within prescribed burn blocks: 608, 609, 610 and 611.

I) Managing Competing and Unwanted Vegetation

USFS Invasive Species:

An assessment report of known noxious weed populations is available in the Analysis File. Noxious weed locations also appear on project maps in the analysis file. If new noxious weed infestations are located within the project area, a noxious weed inventory and site assessment will be completed.

The analysis for vegetation management is conducted in accordance with the 1990 Forest Plan Standards and Guidelines, the 1998 Forest Noxious Weed EA, the Integrated Noxious Weed Management Plan – Wallowa-Whitman National Forest (INWMP, 1992), and the 2005 Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants FEIS. Management activities will give consideration and evaluation of prevention strategies during the planning process (INWMP, Chapter V. Prevention Strategies, Section B).

The following measures shall be implemented to reduce new establishment or spread of noxious weeds and responds to the non-key issue of noxious weeds:

1. Noxious weed locations are on maps located in the East Face analysis file. A copy of these will be included in the contract preparation package, for use by the sale administrator. These sites will be reviewed with the contractor and mitigations explained.

2. Project personnel would inform invasive species personnel pre-seasonally of upcoming ground disturbing project activities so reprioritization of treatment and inventory can begin prior to the start of project activities.

3. Rock pit and sources should be inspected, and cleared prior to use of any materials (see Standard 7).

4. Before road maintenance activities on roads with active infestations occurs the contracting officer (COR) will contact the District Noxious Weed Coordinator, to inform them of maintenance plans.

The Noxious Weed Coordinator will take the appropriate action to treat the noxious weeds on the infested portions of these roads. (Note: Recommended treatment includes removal of previous year's stalks, to be conducted before maintenance activities occur there; and maintenance activities should not be conducted after the current year's plants have bolted and flowered (mid to late June) unless prior treatment of current year's growth occurs.)

5. If new noxious weed infestations are located within the project area, a noxious weed inventory and site assessment (as defined in the W-W INWMP) will be completed. Location of other species, conditions or future treatments may require additional analysis to determine the appropriate treatment method.

6. All mapped weed sites will be designated as "Areas to Avoid" (no decking, skidding or equipment) and include in the contract package, for use by the sale administrator. Logs should not be skidded or yarded through areas infested by noxious weeds. Landings and log decks should not be built on or near sites of noxious weed infestation. Coordinate with invasive species specialists for exceptions.

7. When roads are opened for logging operations, Sale Administrator will notify the Noxious Weed coordinator. Known infestations should be designated as “Areas to Avoid”, and no grapple or hand piling of slash should be allowed there.

8. Highly disturbed areas (which may include: skid trails, landings, road cuts and fills, etc.) will be seeded. The seed mix to be used will consist of native species, or a non-native species mix, to be approved by the District Diverse Species Program. This may include one fast germinating annual grass species to provide immediate ground cover. Seed application rates will be adjusted, as needed to compensate for the broadcast method of application, and to generate vegetation densities adequate to help in deterrence of noxious weed invasion.

9. Seed will be certified weed free, per the Wallowa-Whitman INWMP protocol.

10. All hay or straw used for mulching, erosion control, or other rehabilitation purposes will be weed free (per the Wallowa-Whitman INWMP protocol).

11. All equipment to be operated on the project area will be cleaned in a manner sufficient to prevent noxious weeds from being carried onto the project area. This requirement does not apply to passenger vehicles or other equipment used exclusively on roads. Cleaning, if needed, will occur off of National Forest System lands. Cleaning will be inspected and approved by the Forest Officer in charge of administering the project.

BLM Invasive Species:

Invasive species management on BLM lands will be in accordance with the Statewide BLM FEIS (2010) for vegetation treatments using herbicides on BLM lands in Oregon and the Vale District 5-Year Noxious Weed Control Program EA (1989). A new analysis is being completed on BLM lands for noxious weed management. If this analysis should be completed prior to implementation of vegetation management activities on BLM lands, it could be considered for use during project implementation.

Seed will be certified weed free per the BLM Invasive Management Manual (USDI 2008).

J) Water and Material Sources

Material sources, if needed, will be existing sources. No expansion of sources is anticipated. All work will stay within existing source boundaries. The following rock pits have been identified for project use pending noxious weed inventories (see #3 above):

Table 21 - Rock source locations

Pit Name	Legal Location	Road Access	Type of Material
Dutch Creek	T6S, R37E, Sec. 12	7312400	Crushed, pit-run, grid-roll, rip-rap
Summit Springs	T5S, R38E, Sec. 29	4320038	Crushed, pit-run, grid-roll
Rainbow	T6S, R37E, Sec. 6	5125439	Crushed, pit-run, grid-roll
Porcupine	T5S, R37E, Sec. 23	4300	Pit-run, grid-roll
Unnamed Stockpile	T5S, R37E, Sec. 28	4300510	Pit-run, grid-roll
Unnamed	T5S, R37E, Sec. 26	4300301	Crushed, Pit run, grid-roll, rip-rap

Water sources will be designated from the La Grande and Whitman Ranger Districts Water Source Inventories. Available water sources within this area are as follows:

A limited use water license should be obtained from the Oregon State Water Resources Department prior to any use of water from a stream. The streams that could potentially be used are: Antone Creek, Anthony Creek, North Fork Anthony Creek, Dutch Creek, Webfoot Creek, Wolf Creek, and Clear Creek. Additionally, there are two material sources that hold water: Summit Springs and the unnamed source on Road 4300301, and Grande Ronde Lake has been used as a source of water in the past. Wolf Creek and Pilcher Creek Reservoirs also lie just outside of the project area along primary forest access routes. If considered for use in this project, appropriate permits and licenses would be obtained. Use of any water source, other than a commercial supplier, would be required to use screens on the drafting equipment.

K) Precommercial Thinning

The following constraints will apply to all precommercial thinning (PCT) units:

1. **USFS -** Vegetative visual screens will be maintained adjacent to roads open to vehicular traffic (See District Access and Travel Management Plan) to reduce sight distances and mitigate the reduced big game security. **BLM** – No vegetative visual screens will be required along the roads open to vehicular traffic on BLM lands within the project area during thinning operations.
2. All snags within thinning units will be maintained on site to provide wildlife habitat. Dwarf mistletoe-infected lodgepole pine trees up to 9 inches DBH will be cut.
3. Appropriate contract clauses to protect cultural resources and Proposed, Endangered, Threatened, or Sensitive (PETS) species will be incorporated into the final contract to protect these resources should they be discovered during project implementation.
4. Special or unique features such as rock outcroppings and wet meadows were avoided through thinning unit design (See Wildlife Habitats in Managed Forests in the Blue Mountains of Oregon

and Washington, Thomas 1979, on file at the La Grande Ranger District Office). However, if additional features are encountered during unit layout, well defined edges around these areas will be achieved by retaining a feathered no-cut buffer of at least a hundred feet projected into the stand from the outer edge of the ecotone (area where there is a marked difference in vegetative communities).

5. Thinning design will incorporate concerns related to biodiversity and wildlife habitat. This includes, but is not limited to, developing a mosaic throughout the landscape by leaving areas un-thinned, variable leave tree spacing, and maintaining as much overstory as possible (consistent with item #3 above) within thinning units. Activities will be coordinated with district wildlife personnel.
6. Thinning will be accomplished when possible, while trees are less than 2" in stem diameter. Trees of this size have faster decay rates and fuel loads will be reduced sooner. Where PCT slash affects a large area (40 contiguous acres) whether from this years or previous years, activity will be spread out over several years to reduce fuel accumulations. This mitigation may be waived by the fuels management specialist assigned to the project if determined that fuel loadings are at acceptable levels. Generally 2-3 years is required for needles to fall off, at which time the fire hazard is significantly reduced.
7. Slash treatment is required within 100 feet of an open collector (4 digit) road. Treatments will consist of pull back of all slash 5 feet beyond the shoulders on each side. In areas with cut and fill construction, this distance shall be measured from 5 feet beyond the top of the bank to 5 feet beyond the point where the shoulder meets the fill slope (i.e. hinge point of road shoulder and fill slope). All roads shall be kept free of thinning slash, whether the road is blocked by barriers or not. Within the 100 foot area along the roads maximum slash depth will be 18 inches; boles over 15 feet and greater than 2 inch cut diameter shall be bucked in half.
8. Slash treatment is required within 200 feet of private land boundaries. Treatments will consist of pull back of all slash within 5 feet of the edge of private lands. Within 200 feet of the boundary maximum slash depth will be 18 inches; boles over 15 feet and greater than 2 inch cut diameter shall be bucked in half.
9. All units with ponderosa pine listed as one of the principal conifer species shall be cut between July 1st and December 1st.
10. Special areas (springs, seeps, etc.) will be given a 50 foot buffer.
11. Leave trees shall be selected within the following order of species preference, the most preferred species listed first: ponderosa pine, western larch, Douglas-fir, Engelmann spruce, white/grand fir, and lodgepole pine. This order of preference only applies if the trees are free of damage or defect.
12. Active raptor nest sites will be protected by seasonal restrictions. If raptor nests are found, restrictions will apply (see project file). Appropriate contract clauses will be incorporated into the final contract for protection of raptor nest sites if any are discovered during project implementation.
13. Slash shall be immediately removed from all open roads. Trees will be felled away from roads and established trails. Pull back of all slash will occur 5 feet beyond the shoulders on each side. In areas with cut and fill construction, this distance shall be measured from 5 feet beyond the top of the bank to 5 feet beyond the point where the shoulder meets the fill slope (i.e. hinge point of road shoulder and fill slope). All roads shall be kept free of thinning slash, whether the road is blocked by barriers or not. A spotter shall be required when felling trees which may reach the roadway.

L) Cultural Resource Protection Mitigation Measures

USFS

Several existing historic and prehistoric sites are located within the project area. Sites requiring protection have been mapped and avoidance areas and buffer zones for site protection for East Face Vegetation Management Project activities will be flagged by the WWNF South Zone Archaeologist prior to the onset of project activities.

Historic sites that could potentially be damaged by fire or associated preparatory activities will be avoided and/or protected. During the layout and development of prescribed burn plans, district fuels specialists will work with forest heritage staff to determine the location and appropriate protection measures for known heritage sites.

Wooden structures are at the greatest risk of damage or loss during burning activities. In order to eliminate the risk of damage from fire an appropriately sized buffer zone around structures will be excluded from areas to be burned. Depending upon the size of the buffer zone and the fire behavior anticipated and observed during burning operations, additional protection from embers may also be required. In some instances unit boundaries will be modified to provide the necessary buffer zone, in others fire control methods will be identified and applied prior to or during burn operations in order to prevent fire spread into buffer zones. Fire control methods include the construction of control lines, by hand or with machinery, around historic sites (generally done prior to burning) and the use of wetlines, hoselays, engines or hand crews to prevent fire spread into buffer zones. If previously unknown historic sites are identified during implementation of burning, protection actions will be developed and implemented, including if necessary the delay of burn activities.

Linear features and other historic evidence of human occupancy are at risk of some damage during burning activities, generally through the construction of control lines. Linear features will be identified in burn plans. Pre-burn fireline construction will be limited to the use of handlines and/or wetlines where potential exists to impact historic linear features. A dozer boss will be present to assist in identifying and avoiding historic sites when machinery is used in fireline construction.

Five new cultural sites were discovered during surveys in proposed activity areas for this project. Should any sites be discovered during project activities, the Wallowa-Whitman Forest Archaeologist will be notified immediately and appropriate protection measure employed.

BLM

One new recorded site and one Isolated Find were discovered during surveys on BLM lands. Two previously documented sites could not be relocated. All site boundaries were flagged for avoidance and will not be impacted by project activities. The site will be protected from project activities by flagging (completed during site recording), fencing, and/or other protection measures. Other protection measures may also be implemented by BLM.

M) Recreation

Maintain the character of dispersed camping sites by cleaning up project-created slash. Maintain access to dispersed sites on roads to be left open. Leave adequate space for camping at the point where roads are closed.

Post-sale management of the following roads will be coordinated with the District Recreation Manager in order to maintain mountain biking options and opportunities within the area:

Roads: 7315, 7315030, 7315035, 7315040, 7315045, 7315047, 7315048, 7315090, 7312, 7312031, 7312032, 7312033, 7312034, and 7312035

N) Scenery Management Mitigation Measures

- The District Recreationist Specialist will work with district personnel on treatment prescriptions and marking guides, specifically in the following areas where proposed treatments fall within foreground scenic view allocations. These areas are defined as:
    - Elkhorn Drive Scenic Byway (Forest Road 73) – ½ mile along the length of this road
    - Anthony Lakes Recreation Area – Developed camping area and the Floodwater Flats area (including previous fuel reduction work)
    - Ladd Canyon Forest Road 43 – first half mile of the 4300 road from the junction with the 73 road.
    - North Fork Wolf Creek Forest Road 4315 – Ponderosa pine stands in Units 377 and 22.
- Retain large trees and a variety of vegetation screening/irregular islands along these areas.
- Locate landings out of seen areas or leave vegetative screen for Elkhorn Drive Scenic Byway (Forest Road 73), Anthony Lakes Recreation Area, and Floodwater Flats. Use existing landings, road corridors where feasible, or locate landings outside of seen areas and leave vegetation screen where possible. In general, keep landings as small as possible except where existing landings exist. If landing on forest roads, keep disturbance contained within the existing road prism.
- New temporary roads and landings may be evident but must remain subordinate to the shape and pattern of the natural appearing forest canopy for these areas.
- Foreground regeneration harvests (not to exceed 2 acres) should not be used frequently but can be used in specific circumstances to treat insect or disease infestations, or to open views to scenic attributes such as a rock formations, large ponderosa pine or components, or views to distant mountain peaks.
- Skid patterns, slash, soil exposure and stumps should be visually minor or unnoticed.
- Mechanical evidence created along the Elkhorn Drive area should be rehabilitated to appear natural.
- Cut stumps at a height less than 8” in immediate foreground (300’) Elkhorn Drive Scenic Byway, Anthony Lakes Recreation Area, and Floodwater Flats.
- Slash pile locations would not be located within the immediate foreground, (50’) of Elkhorn Drive Scenic Byway (Forest Road 73), Anthony Lakes Recreation Area, and 43 Road near Anthony Lakes Recreation Area. Disposal of these piles will be considered a priority and be treated within one year.
- Develop marking guidelines to minimize the amount of paint seen from the above areas of scenic concern except North Fork Wolf Creek. Paint of backside (uphill) of leave trees or paint take trees along immediate foreground.

- Complete removal of ribbons, tags, stakes where visible from above areas of scenic concern except North Fork Wolf Creek.
- When constructing new temporary roads or re-opening currently closed roads, or non-system roads on existing road templates, reduce visual impact as much as possible, design with minimal cut and fill following natural landform as much as feasible, minimize vegetation clearing limits, and soften linear clearing edges by feathering or using irregular clearing limits to reduce introduced lines in the landscape. Leave large trees, clumps of trees and vegetation screening on the downhill side of the new temporary roads. Units 120, 123
- When closing roads, blend earth mounds and large boulders with the landscape in visually sensitive areas. Seed with native grasses and vegetation.
- Remove slash in a manner that appears natural and appropriate to the site.
- Locate skyline corridors at an angle to avoid linear effect as viewed from the Elkhorn Drive Scenic Byway (Forest Road 73), keep the corridors narrow. Use irregular clumping and feather corridor edges, use open areas adjacent to corridors and avoid going through dense unthinned areas with corridors if possible. Units 120, 122, 123, 127
- Maintain skyline ridge of trees with varied clumping and spacing of leave trees.
- Cut stumps low to the ground (<8") in the foreground or seen areas (300') along scenic areas of concern except North Fork Wolf Creek Forest Road 4315.
- Locate burn piles away from visually sensitive areas.

O) Improvement-Mitigation Measures with KV or Appropriated Funds

The following projects were identified by the ID team and prioritized in the following order:

ESSENTIAL KV –

- Site preparation burning:
  - Alternatives 2 and 5 - 461 acres @ $95/acre = $13,590
  - Alternative 4 – 129 acres @ $95/acre = $12,255
- Planting:
  - Alternatives 2 and 5 - 461 acres @ $600/acre = $276,600
  - Alternative 4 – 129 acres @ $600/acre - $77,400

MITIGATION (Non-essential KV - in order of priority)

A) Noxious weed control - Grass seeding, control, and monitoring.

- Seeding - 15% of tractor and landing acres @ $15 per acre.
- Control - 1% of seeded acres @ $189 per acre. (hand work or chemical if available)
- Monitor KV Work (seeding and control) - @ $2.88 per acre.

ENHANCEMENT

Table 22 - Enhancement KV Projects in order of Priority

Indicator	Alt 2	Alt 3	Alt 4	Alt 5
1. Removing 2 log culverts	$5,000	$5,000	$5,000	$5,000
1. Release Treatments (@$220/ac)	$801,240	$767,360	$1,475,760	$323,840
2. Road Decommissioning (@$5,000/mile)	$192,500	$192,500	$192,500	$192,500
3. Prescribed Burn Fuels Reduction (@$80/ac)	$534,800	$483,440	$531,440	$534,800
Total	**$1,533,540**	**$1,448,300**	**$3,204,700**	**$1,056,140**

East Face - Alternatives at a Glance

Table 23 – Alternative Overview

Alternative Elements		**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Project Area Boundary (PAB) Acres USFS – 46,412 acres Vale BLM – 1,224		0	**47,636**			
Total Harvest/Noncommercial Treatment Acres		**0**	**17,098**	**13,654**	**16,500**	**18,036**
Harvest Treatment Acres (total)		**0**	**6,722**	**3,879**	**2,844**	**10,221**
Total Acres Treated by Prescription Type (Commercial) *HPO includes treatments in HIM/HPO and HTH/HPO units	HFU	0	245	139	155	245
	HIM	0	2,200	1,198	1,255	2,886
	HPO*	0	143	0	0	143
	HPR	0	43	43	38	43
	HSA	0	210	62	122	210
	HSH	0	318	0	120	318
	HTH	0	3,563	2,437	1,154	3,816
	WFH- Biomass Removal	0	0	0	0	391
	PCT- Biomass Removal	0	0	0	0	2,169
Noncommercial Treatments		**0**	**10,376**	**9,775**	**13,656**	**7,815**
Total Acres Treated by Prescription Type (Noncommercial)	PCT	0	3,447	3,372	6,682	1,277
	WFH	0	5,184	4,658	5,184	4,793
	WFM	0	1,745	1,745	1,700	1,745
	FFU	0	0	0	90	0
Post-Treatment Activities						
Post-Treatment Activities (Acres)	Precommercial Thinning	0	195	116	26	195
	Grapple Pile/Slashbuster	0	10,704	6,842	8,568	8,083
	Handpile & Burn	0	2,102	3,090	4,099	3,929
	Planting	0	461	0	129	461
	Whipfelling	0	6,682	3,879	2,834	7,621

Alternative Elements		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
	Burning for Site Preparation	0	127	0	26	127
	Jackpot Burn	0	3,835	2,820	2,823	4,150
Prescribed Fire (Acres)	Total Burn Block Area	0	6,685	6,043	6,643	6,685
Treatments within RHCAs (Acres)	Precommercial Thinning Treatments	0	238	225	238	45
	Hand Fuel Reduction Treatments	0	753	612	753	747
Yarding Systems (Acres)	Ground Based	0	5,295	3,239	2,092	8,350
	Skyline	0	1,094	416	419	1,450
	Helicopter	0	333	224	333	421
Road Work (Miles)	Reconstruction	0	53	39.3	27.8	61.6
	Temporary Roads - Total • Miles on Existing • Miles of New	0	12.62 6.01 6.61	0	2.62 0.67 1.95	14.71 6.57 8.14
	Miles of Closed Roads Opened	0	107	66.9	38.6	122.7
Enhancement/Safety Work	Danger Tree Removal	No	Yes	Yes	Yes	Yes
	Culvert Replacement for Fish Passage	No	Yes	Yes	Yes	Yes
Harvest Volume in million board feet (MMBF)	Sawtimber Volume	0	16.4	9.3	6.6	18.8
	Non-Saw Volume	0	5.5	3.2	2.4	7.5
	Total Volume (MMBF)	0	21.9	12.5	9.0	26.3

Comparison of How the Alternatives Respond to the Key Issues

The following table compares each alternative with the key issues and key indicators identified in the public involvement section of this EA.

Table 24 – Alternative Comparisons

Comparison Factors		Alternatives				
Key Issue	**Key Indicator(s)**	**1**	**2**	**3**	**4**	**5**
Fire Behavior Potential	Acres of Treatment by Priority Area • Priority Area One • Priority Area Two • Priority Area Three	 0 0 0	 8,619 7,856 623	 7,358 6,058 238	 8,619 7,856 25	 8,686 8,379 971
	Fire Size (One hour after ignition) in Acres	59-85	0.2-0.3	0.2-0.9	0.2-0.9	0.2-0.3
	Fire Rate of Spread (chains/hour)	43-52	3	3-6	3-6	3
	Flame Length (feet)	45-54	1-2	1-3	1-3	1-2
	Torching Index	0	255-496	39-225	39-225	225-496
	Crowning Index	26-42	45-70	31-45	31-45	45-70
Old Growth	Acres of OFMS restored to OFSS • Dry OFSS Percent HRV • Dry OFSS Percent Post-Harvest	0 40-60 3	770 40-60 10	429 40-60 9	457 40-60 7	770 40-60 10
Economics	Total Investments	0	$18.8 million	$13.9 million	$15 million	$22.1 million
	Wages Earned	0	$8.2 million	$6.3 million	$6.9 million	$9.6 million
	Number of Jobs	0	238.3	188.1	211.9	275.8
Improvement of Long Term Forest Health Conditions	Acres of Overstocked Stands Treated	0	11,052	8,399	11,065	11,850
	Percent of Overstocked Stands Treated	0	34%	26%	34%	37%
	Percent of project area change toward desired species cover type	0	37%	29%	36%	40%

Comparison Factors		Alternatives				
Unroaded Areas	Acres of BMFPR PWAs Treated	0	0	0	0	0
	Acres of Fuel Reduction Treatments In identified Undeveloped Area	0	543	485	525	543
Landscape Connectivity	Acres of disturbance within key connective corridors	0	1,356	949	1,297	1,356
Road Access	Miles of New Temporary Road Constructed	0	6.61	0	1.95	8.14
	Miles of Temp Road on Existing Tracks	0	6.01	0	0.67	6.57
	Miles of Road Reconstruction	0	53	39.3	27.8	61.6
	Seasonal Motor Vehicle Use Restrictions Extended (Yes/No)	No	No	No	No	Yes
	Miles of Closed Roads Opened for Project Use	0	107	66.9	38.6	122.7

Monitoring Plan

Monitoring specific to project activities, and not in conjunction with research studies, would be accomplished to assure that activities conform to objectives of the Forest Plan. Project level monitoring is a component of Forest Plan monitoring. The following types of monitoring will be accomplished:

Implementation Monitoring *- Are mitigation measures and BMPs being implemented as planned?*

For example, monitoring of sale layout and timber designation will occur to assure proper application of all identified resource objectives, constraints, and mitigation measures. Monitoring will also consist of timber sale contract administration and firewood cutting utilization and effects to ensure that all required mitigation measures are properly implemented and are effective.

Included in the monitoring activities is compliance monitoring of Proposed, Endangered, Threatened, and Sensitive species (PETS). If PETS species are discovered in the area during project activity they will be protected in accordance with appropriate contract provisions. Additional site monitoring by the district fisheries and watershed staff during road construction, pre-sale layout and marking, and timber harvest will be undertaken to assure compliance with water quality standards, hydrology, and soil parameters.

Effectiveness Monitoring *- Did mitigation and protection measures result in desired effects?*

A walk-through survey of the project area during implementation and after sale closure will be conducted to qualitatively monitor on-site and downstream effects of project implementation.

If monitoring shows that mitigation measures of BMP's are not being implemented as planned or are not being effective in meeting resource objectives, activities will cease or be modified to correct problems.

Handwork within RHCA's will be monitored to determine vegetative responses.

Other

Prescribed Burning Monitoring - Fire Management will conduct monitoring of the prescribed burned acres as outlined in the Wallowa-Whitman Prescribed Burn Monitoring Plan.

Noxious Weeds - The following elements will be monitored and documented; for a list of the species and the responsible person, refer to the Noxious Weed Report in the analysis file:

Table 25 – Noxious Weed Monitoring

Type	Activity Monitored	Frequency and Timing	Responsible Person
Implementation	Noxious weed inspections, equipment cleaning, weed infestation avoidance, weed inventory, documentation and communication.	Prior to move onto NFS lands and during active operations near noxious weed infestations.	Contract Administrator
Effectiveness	Noxious weed survey and inventory	Annually for 3 years following project end.	Zone Invasive Plant Coordinator
Implementation	Broadcast seeding of disturbed soils.	Within the seeding period following soil disturbance	Sale Administrator and Road Maintenance Foreman or COR
Implementation	Road rock sources, pits and/or quarry noxious weed	Prior to use for road construction,	Zone Invasive Plant Coordinator; Zone

Type	Activity Monitored	Frequency and Timing	Responsible Person
	inspections	reconstruction or maintenance	Engineer
Implementation	Noxious weed avoidance while prescribed burning	Included in burn plans prior to burn approval	Burn Plan Coordinator

Fisheries and Watershed - The following is a list of monitoring activities for fisheries and watershed resources, which have been or will be implemented prior to and following the completion of the project. These activities will provide information on evaluation of the sale and for future planning of projects in the area.

a. Monitor the project to ensure that all standards and guidelines in the Wallowa-Whitman Forest Plan are met through implementation of mitigation measures as identified by the interdisciplinary team.

b. Pre-project monitoring for each Forest Management project includes on the ground survey of the project area, and the proposed treatment units. Monitoring of the proposed treatment units includes survey of any stream channels, RHCAs, slope stability, and general riparian vegetation characteristics.

c. Monitoring of the implementation of the project and protection measures will take place throughout the life of the project by the TSA and Watershed Specialist. For example, if an intense thunderstorm caused overland flow and subsequent excessive soil displacement or sediment production, harvest operations would cease until the soil moisture decreased or protection measures were complete. Potential effects from log haul on roads which parallel RHCAs will be monitored throughout the life of the project by the TSA and Watershed Specialist. Timber harvest operations would be halted if adverse impacts are observed at any point during the operation.

Soils - Monitoring would be undertaken to:

a. Ensure that best management practices and mitigating measures incorporated into the sale are being followed.

b. Determine if these practices and measures are adequate to meet the intent of management directives.

Monitoring will occur on 10% of the project activity units to ensure DSC levels remain below Forest Plan minimums for the affected area.

Monitoring of sale layout and contract administration will be undertaken to ensure proper application of all identified constraints and mitigating measures. Ground-based harvest units will be monitored to ensure adequate spacing between skid trails, restriction of equipment to skid trails, prevention of wet weather yarding, and effective subsoiling of compacted skid trails and landings.

Post-harvest activities will be monitored to ensure that guidelines to minimize soil disturbance are being followed. Site preparation activities such as area subsoiling and burning will be monitored to ensure the purpose is achieved without causing additional soil damage.

Table 26 - Wildlife Monitoring Summary

What	Type	When	Who	Why
Snags, logs Sample of units	Implementation	During logging, one year after logging	TS administrator & wildlife personnel	To determine if prescribed material was retained

BLM Monitoring:

Introduction

This monitoring plan describes the activities that the Baker Field Office staff and Vale District Fire personnel would perform to ensure that prescribed burning and mechanized vegetation treatments conform to project design criteria and meet project objectives. This plan guides implementation and effectiveness monitoring through the year 2025 for all burning and mechanical treatments described in the EA on BLM lands.

This monitoring plan satisfies monitoring needs described in the Baker RMP and FEIS, as well as the prescribed fire monitoring requirement described in the Interagency Standards for Fire and Fire Aviation Operations 2012 (USDI-USDA).

Coordination

Since many different resources would be monitored, respective managers and specialists would be involved with various aspects of the monitoring program. Scheduled monitoring visits and data collection would be dependent on treatment objectives, timing of implementation activities, and he responses of specific resources to fire and fire surrogates. For this reason, close and frequent coordination between resource specialists, implementation specialists, and management is essential.

Results and Documentation

Monitoring results would be used to: 1) document fire and silvicultural treatment effects; 2) evaluate the success or failure of treatments and project design elements. Monitoring results and documentation would be maintained by individual resource specialists in paper files, electronic databases, and in GIS. Results may also be kept in a prescribed fire project file or tracked with the Districts' Monitoring Database and Analysis Tools by the District Fuels Specialist.

Table 27 - BLM Habitat Monitoring Requirements and Timing

Element	Type of Monitoring	Objective	Methods	Responsibility	Timing
Cultural Resources	Effectiveness	Evaluate the effectiveness of project design elements for protecting cultural resources.	Conduct monitoring visits at a sample of cultural resources (No more than 10% of total sites in Project Area) and compare post-burn conditions to conditions described in cultural resource databases.	Archaeologist	Within 1 year of treatment with visits every 3 years if necessary.
Fuels Management	Effectiveness	Determine if fuels in treatment units are reduced sufficiently to meet treatment objectives.	Visually estimated burn areas, delineation with GPS.	District Fuels Planner	After Implementation

Element	Type of Monitoring	Objective	Methods	Responsibility	Timing
Fuels Management	Implementation	Determine if weather conditions and prescribed fire parameters are within the range of variability.	Monitor any site or time specific weather and fire criteria as identified in the project burn plan.	Rx Burn Boss	During implementation
Smoke Management	Effectiveness	Determine trajectory and vertical dispersion of smoke plumes.	Visual observation of smoke plume from ground level. Coordination with neighbors and ODF Smoke Mgmt. Assessment of wind speed and direction on day of implementation.	Rx Burn Boss	During and immediately after implementation
Wildlife Biology – Avian	Implementation	Determine if sufficient snags and LWD remain onsite post treatment.	Count LWD and snags/acre in treatment units	Wildlife Biologist	During and immediately after implementation
Botanical – SSS	Implementation	Ensure that areas with SSS habitat values are protected in treatment units.	Monitor project activities by visual observation, photography, and written description.	Botanist	During and after implementation
Vegetation – Post-Fire understory response	Implementation	Ensure that adequate understory seed source is available in prescribed fire treatment units.	Visual estimates, belt transects.	Allotment Administrator	Prior to implementation and/or immediately afterward
Forestry	Implementation	Determine if stand density objectives are attained following treatments.	Monitor unit during layout, mechanical treatment, and prescribed fire activity.	Forestry Specialist	During Implementation
Noxious Weeds	Implementation	Contain, control and/or eradicate existing infestations of noxious weeds. Prevent new infestations from getting established.	Obtain and maintain an inventory of weed locations within the area to help develop priority control objectives and methods.	Weed Coordinator	Continue prevention, early detection, treatment and monitoring of noxious weeds throughout life of project.
Roads	Implementation	Ensure roads used during project implementation area returned to a state that is similar to prior condition.	Visual estimates.	Rx Burn Supervisor Mechanical treatment COR	After implementation

Environmental Impacts of the Proposed Action and Alternatives

To facilitate the reader's understanding of the effects analysis, this chapter describes the current resource conditions to provide a baseline for assessing effects associated with proposed activities. The No Action Alternative (Alternative 1) and Action Alternatives (Alternatives 2 through 5) are described in detail in Proposed Action and Alternatives section, and a comparison of the alternatives is presented in the Alternatives at a Glance table (table 24). This discloses the anticipated environmental consequences of the No Action and the Action Alternatives on various resources for which there are potential direct, indirect and cumulative impacts. The effects analysis forms the basis of comparison of the alternatives through evaluation of the key issues and select non-key issues.

The duration and geographic scale of direct, indirect, and cumulative effects varies, and is addressed by each resource and subject area. In addition, the type of projects considered under the cumulative analysis varies according to the resource and nature of project being considered. Key indicators will be used to measure how each alternative responds to key issues. The effects will be discussed by resource or subject area, with key issues and indicators addressed as appropriate.

For the purposes of this EA, the cumulative impacts are the sum of all past and present actions, and reasonably foreseeable future actions. Past activities are considered in the existing condition baseline for this project. Present and reasonably foreseeable future activities on Forest Service, BLM, and private lands are described in Appendix D of this EA. The purpose of the cumulative effects analysis in the EA is to evaluate the significance of the No Action's and Action Alternatives' contributions to cumulative impacts. A cumulative impact is defined under federal regulations as follows:

> "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

The best available science is considered in preparation of this EA; however, what constitutes best available science might vary over time and across scientific disciplines. As a general matter, we show consideration of the best available science when we insure the scientific integrity of the discussions and analyses in the project NEPA document. Specifically, this EA and the accompanying Project Record identifies methods used, references reliable scientific sources, discusses responsible opposing views, and discloses incomplete or unavailable information, scientific uncertainty, and risk (See 40 CFR, 1502.9 (b), 1502.22, 1502.24).

The Project Record references all scientific information considered: papers, reports, literature reviews, review citations, academic peer reviews, science consistency reviews, and results of ground-based observations to validate best available science. This EA incorporates by reference (as per 40 CFR 1502.21) the Project Record, including specialist reports and other technical documentation. Analysis was completed for the following resource areas: Silviculture, Wildlife, Botany, Proposed, Endangered, Threatened, and Sensitive (PETS) Species, Fire/Fuels, Economics, Soils, Watershed and Fisheries, Access and Travel Management, Range, Noxious Weeds, Cultural/Heritage, and Recreation/Visuals. Information from these reports has been summarized below in this Chapter. The Project Record is located at the La Grande District Office.

This section summarizes the potential impacts of the proposed action and alternatives for each impacted resource.

Fire and Fuels

Introduction

As described in the purpose and need and issues discussed earlier in this EA, the East Face area is prone to severe wildfire behavior and has an extensive fire history with approximately half of the project area experiencing large wildfires within the last 100 years. The following describes the existing fire behavior within the East Face project area and the effects of implementing the proposed fuel reduction activities on fire behavior.

Existing Condition

The following fire behavior characteristics will be used to describe the existing condition for fire behavior within the East Face area and the effects the activities proposed in the East Face project will have on it.

Fire Behavior Characteristics definitions:

Canopy base height - The lowest height above the ground above which there is sufficient canopy fuel to propagate fire vertically (Scott and Reinhardt 2001).

FCCS Fuel Bed – The inherent physical characteristics of fuels that contribute to fire behavior and effects. FCCS describes fuelbeds in 6 horizontal layers including canopy, shrubs, non-woody fuels, woody fuels, litter, lichen-moss, and ground fuels. Each layer, or stratum, is further divided into one or more categories to represent the complexity of wildland and managed fuels. The following fuels beds were used to help determine fire behavior modeling groups.

- ***FCCS Fuel Bed 1530 -*** Warm; dry Douglas-fir; ponderosa pine and grand fir forest. Occurs at elevation between 4000 and 6000 feet in the mountains of northeastern Oregon. Established over 150 years ago after wildfire with no active management through stand development. Stands have past insect damage but no recent management activity or natural change agents. Douglas-fir dominates the overstory and grand fir and Douglas-fir co-dominate the regeneration layer.

- ***FCCS Fuel Bed1590 –*** Cool Moist lodgepole pine forest. Occurs at high elevations in the mountains of northeastern Oregon. Established after a clearcut harvest with woody fuels piled and burned. Stand was precommercially thinned at 10-20 years but has had no subsequent management.

- ***FCCS Fuel Bed 1593 -*** Cold; dry lodgepole pine forest. Occurs at elevations between 6000 and 7500 feet in the mountains of northeastern Oregon. This fuelbed represents a forest of lodgepole pine that established 40 to 80 years ago after a wildfire with no subsequent management.

- ***FCCS Fuel Bed 1545 -*** Cool; moist grand fir forest. Occurs at elevations between 2500 and 6000 feet in the mountains of northeastern Oregon. Established 90 to 150 years ago after wildfire or clearcut harvest and has had no subsequent management.

Crown Fire Potential – The potential for fire to reach canopy layer and to carry through the canopy.

Fire rate of Spread – Distance a surface fire will spread in one hour.

Fire Flame Length – The length of the flame in a spreading fire within the flaming front.

FCCS Fire Potential Code – Three digit code representing the surface fire behavior, crown fire and available fuels potentials scaled to an index of 0-9. A FCCS code of 469 would represent a a fuelbed with moderate surface fire potential (4), above average crown fire potential (6), and extreme potential for biomass consumption (9). Comparing this to a fuelbed with a fire potential code of 222 would indicate that the second fuelbed is predicted to have much lower surface fire potential, much lower potential for crown fire and much lower potential for biomass consumption than the first.

Cohesive Wildland Fire Management Strategy (National Strategy)

The objectives of the treatments within the East Face project are tiered to the goals identified in the National Strategy. Those goals are:

- Restore and maintain landscapes so that all jurisdictions are resilient to fire related disturbances in accordance with management objectives.
- Create fire-adapted communities so people and infrastructure can withstand a wildfire without loss of life or property.
- Improve wildfire response so all jurisdictions participate in making and implementing safe, effective, efficient risk based wildfire management decisions.

Fire Behavior Modeling Groups**:** The stands within the project area were grouped into three modeling groups based on potential vegetation groups (PVG), surface fuel loadings, crown fuel characteristics and potential fire behavior. Field inventory was completed on representative stands within each of the modeling groups to gather surface and crown fuel data. This data was then extrapolated to all the stands within each of the modeling groups and input into fire behavior models. The following table displays how the modeling groups were defined.

Table 25 – East Face Modeling Group Definitions

Modeling Group	PVG	Species description	Fire Regime	Representative FCCS Fuel Bed	Acres of project area represented by modeling group
1	Dry Upland Forest	Ponderosa Pine -Mixed Conifer	1	1530	4,500
2	Cold Upland Forest	Lodgepole Pine, Anthony Creek Fire	3/4	1590 / 1593	15,841
3	Moist Upland Forest	Grand Fir – Mix conifer	3	1545	7,614

Modeling Group 1 Stand Characteristics: lower elevation/south facing slopes that contain a mix of Ponderosa Pine and Douglas fir dominated stands.

***Modeling Group 2 Stand Characteristics**:* lodge pole stands that regenerated after the Anthony Creek fire burned 15,000 acres within the project area.

***Modeling Group 3 Stand Characteristics**:* mix conifer stands with an overstory comprised of grand fir, lodgepole and western larch.

Table 26 - Standard Fire Behavior Fuel Models (Scott and Burgan, 2005) within the project area.

Fuel Model	Acres	% of Project Area
TU5	28,739	62
GR1	1571	3
TL8	10835	23
GR2	4210	9
Other	1057	3
Total	**46,412**	**100**

Standard fuel models are described as follows:

TU5 – The primary carrier of the fire is heavy forest litter with a shrub or small tree understory. Spread rate is moderate; flame length moderate.

GR1 – The primary carrier of the fire is sparse grass, though small amounts of fine dead fuel may be present. The grass is short naturally or from grazing.

TL8 – The primary carrier of the fire is a moderate load of long-needle pine liter, may include small amounts of herbaceous load.

GR2 – The primary carrier of the fire is grass, through small amounts of fine dead fuels may be present.

Stand data and field reconnaissance were utilized in multiple fire behavior modeling programs (FCCS, FVS-FFE and FMA Plus) to determine existing fire behavior for each modeling group. The following tables display stand characteristics and existing fire behavior at the 97 percentile weather for each modeling group.

Table 27 - Existing Fire Behavior Characteristics (FCCS)

Fire Behavior Characteristics	Modeling Group 1	Modeling Group 2	Modeling Group 3
Representative Fuel Model	TU5	TU5	TU5
FCCS Fuels bed	1530	1590 / 1593	1545
Crown Fire Potential	High	High	High
Fire Rate of Spread (ch/hr)	48	52	43
Fire Flame Length (ft)	45	54	46
FCCS Fire Potential Code	579	675*	479
Basal Area	172	196	150
Canopy Base Height	1	3	2
Size of fire in acres one hour after ignition	63	85	59

* FCCS fuel bed was customized to include brush fuels loadings.

Existing fire behavior within the East Face project area has the potential to be very erratic, very fast spreading and very resistant to being suppressed as demonstrated by past wildfires (Anthony Creek and Tanner Gulch fires). Large portions of the project area consist of hazardous fuels conditions with a high potential for crown fire (reference Fire Behavior Appendix).

Effects Analysis

This analysis addresses the effects of implementing the proposed alternatives for the East Face project area in relation to the key issue "Fire Behavior Potential".

A number of factors including canopy base heights, crown fire potential, rates of spread and flame lengths were analyzed in determining differences between alternatives (reference detailed modeling results in the Fire Behavior Appendix). Fire managers are interested in flame lengths, fire rates of spread and crown fire potential because it determines what suppression strategies would be most effective.

The key indicators used to compare the alternatives were:

Acres of treatments by Priority Area – Number of acres of treatments that are proposed within each priority area.

Size of fire in acres on hour after igniton – a realitive measure to compare wildfire spread rates.

Fire rate of Spread – Distance a fire will spread in one hour.

***Fire Flame Length* –** The length of the flame in a spreading fire within the flamimg front.

***Torching Index* -** is the 20 foot wind speed at which a ground fire will torch into the crown initiating a crown fire. The lower the torching index, the lower the wind speeds need to be to initiate torching. A torching index of 0 means that there is a very high potential for a crown fire to occur.

***Crowning Index* -** is the 20 foot wind speed at which active crown fire is possible. The lower the crowning index, the lower the wind speeds need to be to initiate active burning in the crown and spread through the canopy. A low crowning index (closer to 0) indicates that there is a very high potential for an active crown fire.

Method of Analysis

Assumptions:

The direct and indirect effects analysis area for fire and fuels resources encompasses all of the East Face project area along with Elkhorn Wildlife Area and the adjacent private lands within 1.5 miles of the project boundary.

The cumulative effects analysis area for the East Face project is as follows:

> The cumulative effects boundary for vegetative treatments which modify fire behavior encompasses the Powder River-Wolf Creek and North Powder River (HUC 5) watersheds and the Upper Beaver Creek, Limber Jim Creek, Tanner Gulch Grande River and Upper Ladd Creek HUC 6 sub watersheds.
>
> The cumulative effects boundary for smoke generated from both prescribed and wild fire encompasses Union, Baker, Umatilla, and Grant counties.

Defensible Fuels Profile Zones

An important component when managing forest for wildfire is to provide treated areas or Defensible Fuels Profile Zones that disrupt or alter fire progression and or enhance suppression opportunities.

Defensible Fuels Profile Zones (DFPZ) are not designed to stop fires but to allow suppression forces a higher probability of successfully attacking a wildfire. Creation of DFPZ's is proactive approach to affect fire behavior in anticipation of a future wildfire. The effectiveness of a DFPZ depends not only its design characteristics (size, location and type of treatment) but also on the behavior of fires approaching it. Such behavior is strongly determined by fuel spatial pattern in the adjacent areas and any thinning beyond the fuel break will improve its effectiveness. Consequently, fuel treatments in adjacent lands would determine fuel break width and canopy alteration.

Spotting distance from torching trees is also a major factor in determining the width of a DFPZ. Fire behavior modeling has shown that spotting distance over a ½ mile can be expected under large fire environmental conditions (reference Fire Behavior Appendix).

A DFPZ is created by reducing surface fuels, increasing the height to the base of the live crown, and opening the canopy by removing undesired trees. Implementation of the treatments which modify those stand characteristics would change the behavior of a wildfire entering the fuels-altered zone.

East Face treatments would be designed to create DFPZs by:

1. Reducing surface fuel loads
2. Increasing crown base heights
3. Reducing canopy densities
4. Retaining the largest healthiest trees to create shade and moderate wind speed.

Table 28 - Scientific Principles of Fire Behavior

Principle	Effect	Advantage
Reduce surface fuel loads	Reduces potential flame length/fire intensity	Increases fire suppression opportunities and probability of success
Increase crown base heights	Requires longer flame length to begin torching	Reduced probability of torching
Reduce canopy density	Makes tree to tree crown fire less probable	Reduced crown fire potential.
Retain larger trees	Thicker bark and higher crowns	Moderates wind speed and shades fuels

Modeling Groups

As described under existing conditions above, the stands within the project area were grouped into three modeling groups based on Potential Vegetation Group (PVG), surface fuel loadings, crown fuel characteristics and potential fire behavior.

Fire behavior modeling and observed fire behavior from past wildfires within or near the project area were used to predict both existing and post treatment fire behavior. Environmental inputs for modeling were obtained from weather records at the closest weather station. Fire behavior fuel models are used as input to the Rothermel (1972) fire spread model, which is used in a variety of fire behavior modeling systems. The fuel models used in this analysis are from Scott and Burgan's "Standard Fire Behavior Fuel Models" (RMRS-GTR-153, June, 2005). The Fuel Models used in this analysis to represent pre-treatment and post treatment conditions are:

- TU5 (pre-treatment) – The primary carrier of the fire is forest litter with a shrub or small tree understory.
- TL3 (post-treatment) – The primary carrier of the fire is a moderate load of conifer litter and a light load of coarse fuels.

Duration of Effectiveness

The duration of the effectiveness of the fuels reduction treatments in the action alternatives has been categorized by modeling group:

Modeling Group 1 / Dry Upland Forest stands will require a low intensity maintenance burn within 10 to 15 years after completion of the proposed actions. These treatments will be designed maintain fire tolerant tree densities and surface fuels at appropriate levels.

Modeling group2 / Cold Upland Forest stands comprised of mostly lodgepole will require a mechanical treatment such as PCT to maintain desired tree composition and densities within 20 years after the completion of the proposed actions. Surface fuels will be maintained at appropriate levels with a combination of mechanical fuels techniques such as mastication or grapple pile and burn. A commercial thin will be required within 30 years to maintain canopy densities at levels which have low potential for crown fire.

Modeling Group 3 / Moist Upland Forest stands will require a mechanical treatment such as PCT to maintain tree densities within 15 to 20 years after the completion of the proposed actions.

Surface fuels will be maintained at appropriate levels with a combination of prescribed underburning and mechanical fuels techniques such as mastication. A commercial thin will be required within 30 years to maintain canopy densities at levels which have low potential for crown fire.

Weather Conditions

Fuels Management Analyst Suite was used to make fire behavior predictions. Environmental conditions and weather inputs were derived from data from the Johnson Ridge Remote Automated Weather Stations (RAWS). Stand exam data backed up by field recon were used to determine stand characteristics used in the fire behavior modeling.

Models

The modeling results will show how the alternatives would change both surface and crown fire behavior within the project area. The following fire behavior and smoke emissions modeling programs were used in this analysis:

- **Fuels Management Analyst Suite** was used to make fire behavior predictions.
- **Fuels Characteristic Classification System (FCCS)** was used to make fire behavior predictions and visualizations.
- **Fire and Fuels Extension- Forest Vegetation Simulator (FFE-FVS**) will be used in this analysis to provide visual images of stand structures and fire behavior before and after fuels reduction treatments.
- **Fire Behavior Observations** from Tanner Gulch, Red Mountain and Anthony Creek wildfires.
- **BlueSky Playground 2.0 beta** used to model smoke emissions.

Modeling specifics are located in the Fire Behavior Appendix in the East Face project record.

Alternative Summaries

Two broad categories of fuels treatments are proposed under the action alternatives:

Mechanical fuels reduction treatments – would reduce and/or remove surface, ladder and crown fuels including dead standing and down trees. Commercial thinning, improvement cuts, precommercial thinning, mastication, grapple piling, and hand piling are examples of mechanical fuels treatments. All thinning treatments would be followed by prescribed fire or other mechanical treatments such as mastication to reduce surface fuels thereby reducing the intensity of potential wildfires (*Graham, McCaffery and Jain. 2004).*

Surface fuels would be reduced to less than 10 tons/acre in the harvest/biomass removal units. Post-harvest slash treatments would primarily be mastication and jackpot burning.

Treatment units with no harvest or biomass removal would require a grapple or hand pile burn to reduce surface fuel to desired levels.

Prescribed fire treatments – are an effective means to reduce surface fuels, thin suppressed overstocked regeneration, increase canopy base height. These management ignited fires are implemented when fuel moistures are moderate, spring or late fall, and generally burn with lower intensity than wildfires. Fine fuels are burned, but most large diameter fuels are only charred. Direct effects of prescribed fire include reducing surface fuel loadings and potential flame lengths, thus reducing potential fire behavior. Because prescribed fires are less intense and less severe than most wildfires, they are less likely to damage soils and kill overstory trees. Control lines would include roads, natural barriers and brush removal rather than bare mineral soil line construction where possible. Existing standing large snags (>12 inches, DBH) would be protected during firing operations through avoidance or fuels reduction (FDR) as practical.

Table 29 - Acres of Mechanical Treatments by Priority Area

Priority Area	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
1	0	8,619	7,358	8,619	8,686
2	0	7,856	6,058	7,856	8,379
3	0	623	238	25	971
Total	**0**	17,098	13,654	16,500	18,036

Table 30 - Acres of prescribed fire treatments

Treatment	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Jack Pot Burn	0	3,835	2,820	2,823	4,150
Site Prep Burn	0	127	0	26	127
Natural Fuels Burn	0	6,685	6,043	6,643	6,685
Grapple Pile Burn	0	5,425	3,615	6,540	2,309
Hand Pile Burn	0	2,102	3,090	4,099	3,929
Total	**0**	18,174	15,568	20,131	17,200

Table 31 - Emissions from Prescribed Fire Treatments

Emission (Tons)	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
PM 10	0	3,266	2,656	3,488	2,900
PM 2.5	0	2,809	2,282	2,992	2,491
CO	0	25,646	20,904	25,460	24,210
CO2	0	498,381	404,218	570,355	413,885
Green House Gasses (GHG's)	0	559,323	453,868	632,307	470,323

Direct and Indirect Effects on Fire Behavior & Air Quality

A. FIRE BEHAVIOR POTENTIAL

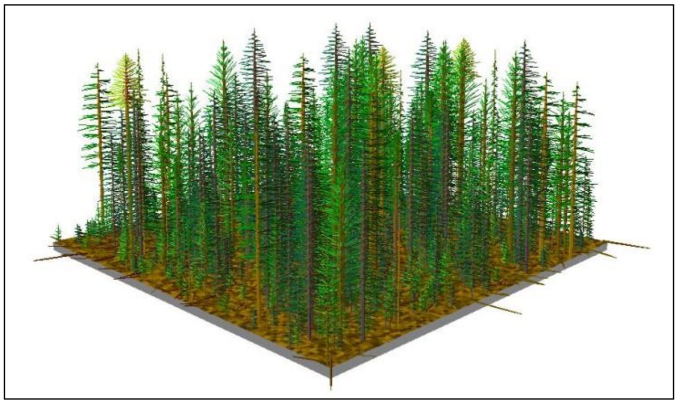
ALTERNATIVE 1- No Action

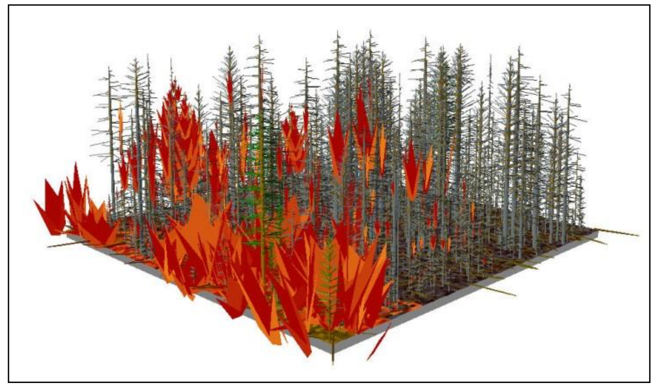
The "no action" alternative would result in no reduction in surface or canopy fuel loadings and as a result the potential for adverse effects from a high intensity wildfire will remain high. Within the analysis area, multi-layered stand structures, tree densities and live vegetation continue to grow. Also, surface fuels continue to accumulate, creating conditions that allow fire to move vertically from the surface level to the forest crown. Overstocked stand conditions will continue to increase the susceptibility of the stands to insects and disease, resulting in increased surface and crown fuel loadings and associated fire behavior potential. These conditions will continue to limit firefighting opportunities, pose undesirable risk to private property, firefighter and public safety, and continue the risk of damaging impacts to natural resources.

The following fire behavior simulations were created using FVS-FFE (, existing stand conditions data and large fire weather parameters were used to create the wildfire scenario.

Modeling Group 1 – Dry Upland Forest

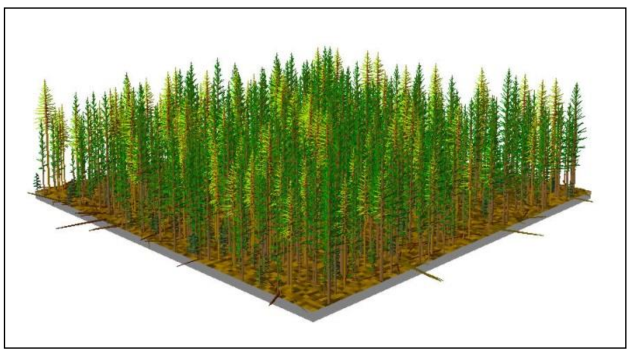
Existing Stand | Wildfire with existing conditions

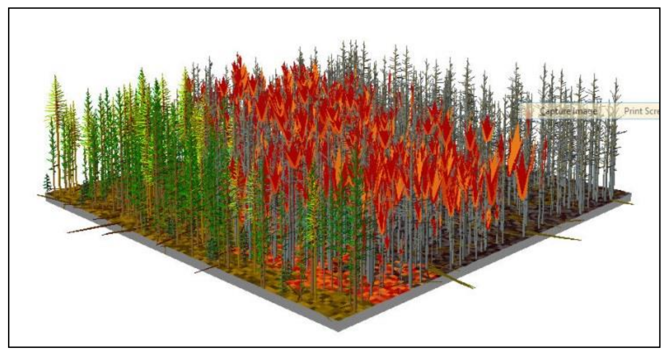




Modeling Group 2 – Cold Upland Forest

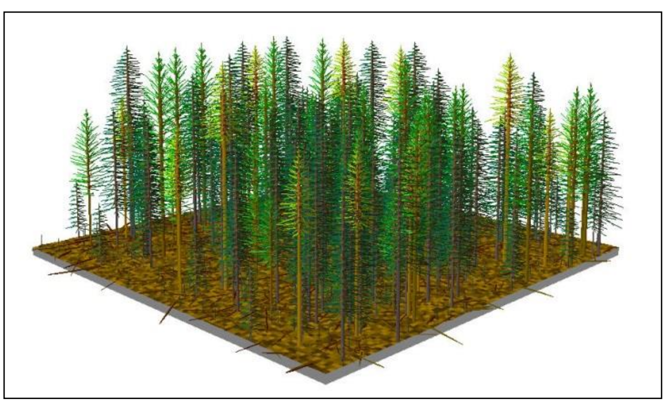
Existing Stand | Wildfire with existing conditions





Modeling Group 3 – Moist Upland Forest

Existing Stand | Wildfire with existing conditions



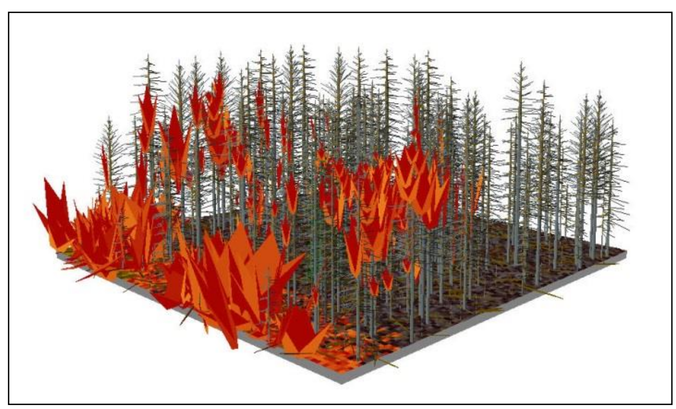


Table 32 - Potential Fire Behavior with Implementation of Alternative 1

Characteristics	Modeling Groups		
	1 (Dry Upland Forest)	**2** (Cold Upland Forest)	**3** (Moist Upland Forest)
Surface Fuel Model	TU5	TU5	TU5
Basal Area	172	196	150
Canopy Base Heights	1	3	2
Fire Rate of Spread (ch/hr)	48	52	43
Fire Flame Length (ft)	45	54	46
Fire size 1 hour after ignition (acres)	63	85	59
Torching Index	0	0	0
Crowning Index	42	26	36

The existing low canopy base height facilitates ignition of the crown fuels by a surface fire. The canopy bulk density exceeds the threshold values for crown fire. Crown height is used as the upper level of the crown space for determining crown fuel loading and the starting height of lofting embers". Many of the stands within the project area have high potential for long range spotting potential due to the heavy surface fuel loading and associated surface fire intensity.

Direct and Indirect effects of Alternative 1 are:

1. Stand structure and function would continue to move further from historical range of variability in fire regimes one and three.
2. A continuation of heavy surface fuels capable of producing extreme fire behavior.
3. Crown fire potential remains high.
4. High potential for a crown fire to initiate within the project area and spread on to State and private property.
5. Lack of functional DFPZs in the Rock Creek Bulger and Anthony Lakes WUI places private property and recreation residences at risk to wildfire.
6. Lack of DFPZs adjacent to the Twin Mountain, Upper Grande Ronde and Beaver creek IRAs limit suppression options and decreases firefighter safety.
7. Rate of fire spread exceeds the production rates of initial attack hands crews in direct attack methods decreasing the likelihood of containing a fire while it is still small.
8. Lack of DFPZs limit options for suppression activities and the ability to strategically contain a fire within smaller blocks of land which are surrounded by areas of reduced fuels from which to safely direct or indirect attack the fire (compartmentalize).
9. Prescribed burning opportunities are limited due to the high risk of escape and potential for smoke intrusions into La Grande and Baker City.
10. Increased risk of damaging impacts to soil, vegetation and watersheds from high intensity/severity wildfire.
11. Wildfire suppression costs would continue to increase without treatment of hazardous fuels due to the increased likelihood of larger fires requiring extensive firefighting equipment and manpower.
12. Decrease in forest resistance to fire, drought, and disease from increasing density of trees.
13. Lack of safe egress routes for suppression resources due to heavy fuel loading adjacent to major road systems.
14. High probability that fire brands from torching trees will cross fire lines constructed in areas that have had no pretreatment.
15. Delayed response times for initial attack resources due to the ingrowth of vegetation in existing road beds and lack of road maintenance.

16. Landscape resiliency to future wildfire, insect and disease risk remains low.

Summary: This alternative would not meet the purpose and need for this project because it does not create DFPZs or reduce potential fire behavior. Excess surface, ladder and crown fuel loadings would remain in critical locations within the project. Tree densities and live vegetation would continue to grow and dead wood would continue to accumulate, creating fuel conditions that allow fire to easily move vertically from the surface level into the forest canopy.

Overstocked stand conditions would continue to increase the susceptibility of the stands to mortality from insects and disease resulting in increased surface and crown fuel loadings and associated fire behavior potential. The current fuels profile and poor egress routes limit fire suppression opportunities, decrease firefighter and public safety, increase the risk for loss of private property and natural resources and increase negative impacts to visuals.

Wildfire suppression strategies within this project area would have to rely heavily on indirect tactics with burnout operations near or on private property under this alternative. The existing hazardous fuels conditions and associated fire behavior potential increase the likelihood of fire control problems, spotting across fire lines, and increased risk to private land, roadless areas, and the municipal watershed.

The cohesive wildfire strategy principles would only be implemented on the adjacent private and state managed lands.

ALTERNATIVE 2

Treatments proposed in Alternative 2 modify vegetative structure and fuel loadings to reduce wildfire behavior, increase firefighter and public safety, and improve landscape resiliency. Fuels treatments in this alternative are not designed to stop wildfires but rather to modify fire behavior. Firefighters can often use treated areas to increase fire suppression effectiveness and limit fire spread. The DFPZ's created in this alternative provide a fire suppression anchor point to reduce the potential of landscape-level wildfire.

Accessibility is also important in fighting forest fires. Many fires which burn large acreage do so because firefighting equipment and personnel cannot reach the scene in a timely manner. The DFPZ's constructed adjacent to roads and the associated road maintenance would improve firefighter's response times and provide safe egress from a fire if needed. The sooner firefighters can safely reach a wildfire with equipment, the better the chances of preventing a small fire from becoming large.

DFPZ's would be created using a combination of harvest, thinning, pruning, burning and surface fuel reduction treatments. Completed treatments would assist fire managers in burn out operations. One of the most common firefighting techniques is the use of a controlled backfire to create a fuel break in front of an advancing fire. Treatments completed under this alterative would create DFPZ's in advance of a wildfire thus reducing the time needed to implement backfiring and containment strategies.

Fuel treatment strategies in Alternative 2 includes thinning (removing ladder fuels and decreasing tree crown density) followed by prescribed fire, piling and burning of fuels, or other mechanical treatments that reduce surface fuel amounts. This approach reduces canopy, ladder and surface fuels, thereby reducing both the intensity of potential wildfires *(Graham, McCaffery and Jain. 2004. RMRS-GTR-120).* Many of the forested stands within the project area have not experienced fire or thinning for several decades, heavy thinning combined with (often multiple) prescribed-fire or other surface fuels treatments, or both is necessary to effectively reduce potential fire behavior and crown fire hazard *(PNW-GTR-628).* The proposed commercial thinning treatments that reduce canopy bulk density (crown closure) would reduce the potential for crown fire development if surface fuels are concurrently treated (*Cruz et al. 2002, Rothermel 1991, Scott and Reinhart 2001, van Wagner 1977).*

"A surface fire may make the transition to some form of crown fire depending on the surface intensity and crown characteristics" (*Van Wagner 1977 and 1993*). Alternative 2 treatments reduce surface, ladder and crown fuels thus reducing potential fire behavior. Treatments would also maximize managing towards large fire resistant trees which create shade and decrease mid flame wind speed. Thinning treatments would be designed to leave the largest/healthiest trees on site to provide shading of surface fuels and partial sheltering surface wind speeds *(Fireline Handbook Appendix B Fire Behavior, 2006)*. Smaller diameter tree densities would be reduced to minimize the potential for crown fire initiation. This partially shaded gap between the surface and crown fuels would also minimize the potential for crown fire.

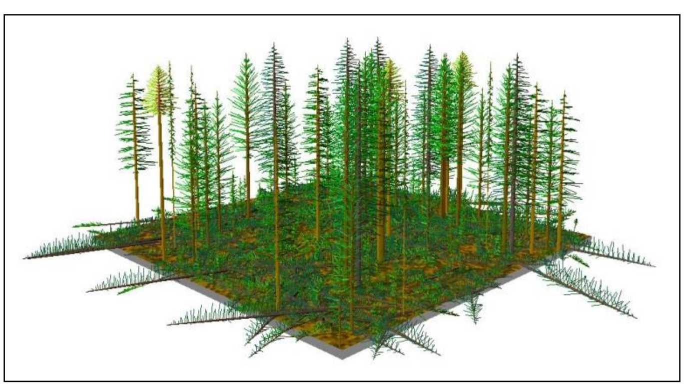
A reduction of surface and crown fuels reduces the potential for extreme fire behavior. Flame lengths would be reduced to intensities 4ft or less (Reference Fire Behavior Appendix) which allow firefighters to safely implement direct fire suppression tactics. Having the opportunity to utilize direct suppression tactics decreases the potential fire size, the risk to public and firefighter safety, the municipal watershed and private property.

The 6,722 acres of harvest treatment activities will create a short term increase in fine fuel loadings (3 inch minus size classes) immediately following harvest activities. It is anticipated that these fine fuel loadings are expected to range from 8-10 tons per acre. In all of these stands, post-harvest slash reduction treatments are planned. Fire hazards immediately following activities are not severely elevated due to the green nature of the slash. Depending on the weather, the slash could cure rapidly and present a short-term (several months) elevated hazard risk in the late summer before fall rains/snows arrive. A curing period is required to achieve desired fuel consumption when prescribed burning. Fuel loadings generally are compacted closer to the ground by winter snows (reducing the potential for crown fire) and after a period of drying in the late spring/early summer they are generally ready for prescribed burning. Therefore, if the fuels reduction treatment takes place within the year following harvest, there is a short term (3 months) period of elevated potential for high intensity burning conditions in the event of a wildfire during this period. This occurrence depends largely on weather conditions and the relatively low potential for an ignition in that exact same area. This risk would be immediately reduced following the completion of the activity. Should burning be delayed – this risk would remain in place for the hottest four months each summer for a 2 year period after which the fine fuels will be on the ground and decomposed to the point that they are no longer a flash fire hazard.

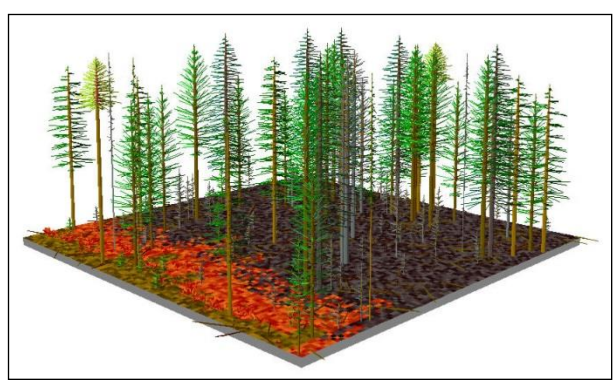
The following fire behavior simulations were created using FVS-FFE (Reference Fire Behavior Appendix). All modeling groups underwent a ladder/crown fuel reduction treatment and a post-harvest treatment to reduce surface fuel loadings. Existing stand conditions data and large fire weather parameters were used to create the wildfire scenario after completion of the proposed activities.

Group 1 – Dry Upland Forest

After Thinning

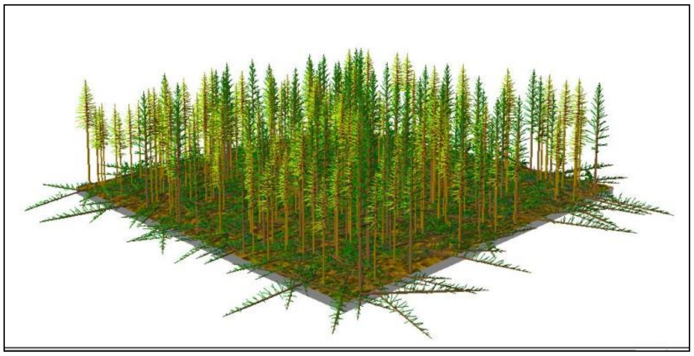


Wildfire after treatments

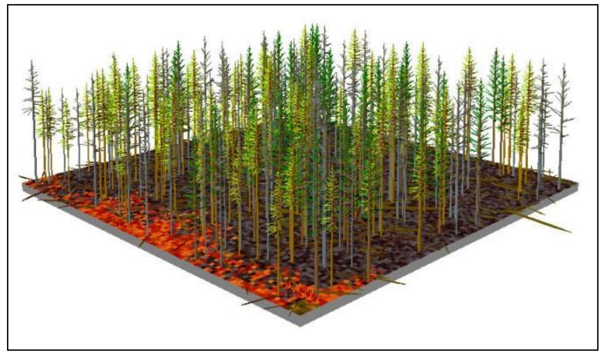


Group 2 – Cold Upland Forest

After Thinning

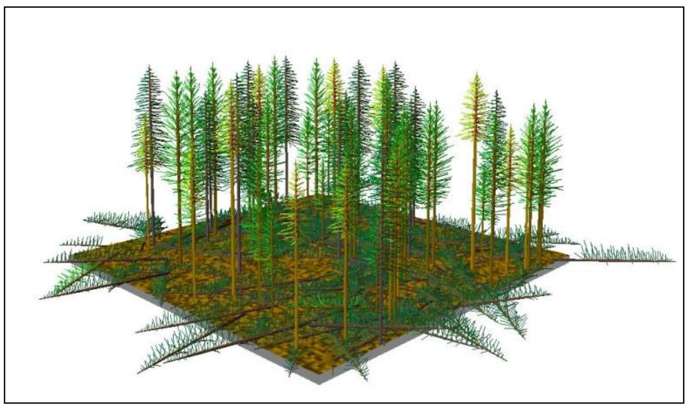


Wildfire after treatments



Group 3 – Moist Upland Forest

After Thinning



Wildfire after treatments

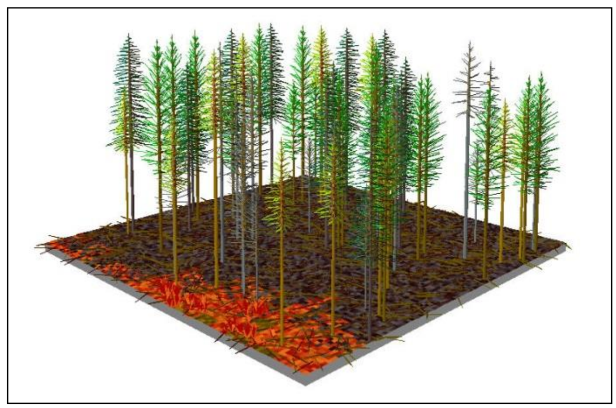


Table 33 - Potential Fire Behavior with Implementation of Alternative 2

Characteristics	Modeling Groups		
	1-Dry Upland Forest	2-Cold Upland Forest	3-Moist Upland Forest
Surface Fuel Model	TL3	TL3	TL3
Basal Area	106	103	103
Canopy Base Heights	21	9	14
Fire Rate of Spread (ch/hr)	3	3	3
Fire Flame Length (ft)	2	1	1
Fire size 1 hour after ignition	.3	.2	.3
Torching Index	496	255	225
Crowning Index	70	45	52

Direct and Indirect effects of Alternative 2:

1. A reduction of surface and crown fuels reduces the potential for extreme fire behavior.
2. Flame lengths would be reduced from an average of 50 feet to 1-3 feet on treated acres. Hand crews can use direct fire suppression tactics when flame lengths do not exceed four feet. Engines and dozers (where roads and terrain allow) can directly fight fire with 4-8 foot flame lengths.

Having the opportunity to utilize direct suppression tactics decreases the potential fire size, the risk to public and firefighter safety, and private property.

3. DFPZ's created in strategically sound locations to initiate suppression operations, increase the probability of successfully containing a fire quickly.
4. Crown fire potential is reduced (refer to modeling results above).
5. Creation of a functional DFPZ's in the Rock Creek Bulger and Anthony Lakes WUIs decrease risks to private property and recreation residences from fire.
6. Reduction of surface and ladder fuels increases prescribed burning opportunities and decreases potential smoke emissions.
7. Creation of DFPZ's adjacent to the Twin Mountain, Upper Grande Ronde and Beaver creek IRA's increases suppression options and firefighter safety.
8. Prescribed fire treatments would produce smoke emissions noticeable to general public for short durations (less than 48 hours).
9. Reduced wildfire intensity and severity lessen the risk of damaging impacts to soil, vegetation, watersheds, and visuals.
10. Increased forest resistance to fire, drought, and disease from decreased density of trees.
11. The proposed road maintenance will improve wildfire initial attack response times and increase firefighter safety by improving egress routes.
12. Mechanical treatments would decrease the amount of pollutants generated during a prescribed burn or wildfire. Smaller less intense fires would produce less smoke.
13. Creation of safe egress routes for suppression resources due to a reduced surface fuel loading adjacent to major road systems.
14. Reduced probability that fire brands from torching trees will cross fire lines constructed in DFPZ's.
15. Cost of firefighting would be reduced with smaller, less intense wildfires. Fuel treatment costs over the next 20 to 30 years are expected to be reduced. A recent study on the Fremont and Okanogan National Forests show the cost of fuel treatment over time are cost effective when compared to the costs associated with wildfire and loss of revenues from forestlands (Mason and others, 2006).
16. The completion of the treatments in priority 3 units reduces tree densities to desired levels and increases the percentage of fire tolerant trees species on site.

Summary: Alternative 2 meets the purpose and need of this project, DFPZ's would be created using a combination of harvest, thinning, pruning, burning and surface fuel reduction treatments. Completed treatments would assist fire managers by reducing potential fire behavior in strategic locations. The DFPZ's constructed adjacent to roads and the associated road maintenance would improve firefighter's response times and provide safe egress from a fire if needed. DFPZ's would also result in the compartmentalization of the project area thus decreasing the potential wildfire size. This compartmentalization would provide fire managers with options to utilize confine and contain suppression strategies when appropriate.

Alternative 2 moves fire adapted ecosystems in the drier portions of the project area towards their range of historic conditions. Treatments would be designed to increase the percentage of fire tolerant tree species such as ponderosa pine, western larch and Douglas fir. Fire would be reintroduced into the project area, surface fuel loadings would decrease, and the gap in vegetation profiles between historical conditions and current conditions would decrease.

ALTERNATIVE 3

Alternative 3 modifies the proposed action by eliminating all regeneration harvest treatments, temporary roads, road reconstruction, harvest in LOS below HRV, treatments in PWA, treatments in MA15, and treatments in connective corridors units. Only noncommercial treatments would occur in the MA6 and in LOS below HRV.

Treatments not changed from Alternative 2 would have the same fire behavior modeled under that alternative. Units deferred from treatment consideration under this alternative would have fire behavior similar to that modeled under Alternative 1.

Mechanical fuel treatment strategies in Alternative 3 reduce surface fuels to the desired levels, but only partially decrease canopy density/basal area to the desired level in the treatment units that changed from commercial to noncommercial. This noncommercial treatment removes a portion of the ladder fuels (no trees above 7" DBH would be removed) which leaves the stands with higher than desired tree densities and canopy fuel loading.

Table 34 - Basal Area Post Treatment Comparison

Categories	Basal Area (Post treatment)		
	Group 1 – Dry Upland Forest	Group 2 – Cold Upland Forest	Group 3 – Moist Upland Forest
Existing Basal Area	172	196	150
Desired Basal Area	100	100	100
Basal area shown is for proposed action units that received a commercial thin (max cut dbh of <21"	106	103	103
Basal area shown is for the units that were commercial under the proposed action but changed to noncommercial (max cut dbh of 7").	158	164	145

The following table displays the fire behavior characteristics for the treatment units which only thin trees less than 7" DBH.

Table 35 - Potential Fire Behavior with Implementation of Alternative 3

Characteristics	Modeling Groups		
	Group 1 – Dry Upland Forest	Group 2 – Cold Upland Forest	Group 3 – Moist Upland Forest
Surface Fuel Model	TL3	TL3	TL3
Basal Area	158	164	145
Canopy Base Heights	6	8	12
Fire Rate of Spread (ch/hr)	6	3	5
Fire Flame Length (ft)	3	1	3
Fire size 1 hour after ignition	.9	.2	.7
Torching Index	39	225	138
Crowning Index	45	31	36

Implementation of Alternative 3 would eliminate the option for offsite removal of excess biomass on 2,843 acres. Prescription changes from commercial to noncommercial would:

> Diminish the effectiveness of the proposed crown fuel reduction treatments (trees greater than 7"DBH would not be cut).

Create hazardous surface fuels loads, beyond what could be effectively jackpot burned, forcing expensive hand pile treatments.

Increase the amount of material pile burned. It is estimated that 30 tons of biomass/acre would need piled and burned, increasing the potential for soil damage and increasing probability smoke intrusions into the local community.

The Twin Mountain, Upper Grande Ronde and the Beaver Creek IRA's are located adjacent to the project area. The potential for extreme fire behavior in these areas makes it more likely that suppression resources could be overwhelmed without adequate DFPZ's located adjacent to forest roads 43 and 73.

The 73 and 7307 roads are the primary access routes for firefighters on the southern portion of the project. Currently the fuels characteristics adjacent to the roads are comprised of hazardous fuels that are capable of producing extreme fire behavior. Alternative 3 eliminates treatments in the old growth (MA15) portion of unit 134 which leaves a gap in the proposed DFPZ. This 94 acre portion of the stand identified for treatment within the proposed action has stand structures (abundant ladder fuels with high canopy bulk density) and fuels profiles that would support high intensity crown fire. Lack of a DFPZ along the road system decreases opportunities to use this road system as a control line during fire suppression operations thus increasing the potential for a large, high intensity wildfire to spread northward out of the roadless area towards the Rock Creek Bulger WUI.

The duration of the effectiveness of the fuels reduction treatments under this alternative can be categorized by modeling group:

Modeling Group 1 / Dry Upland Forest stands – Due to higher crown fuel levels and fire intolerant tree species left within the stands, the initial prescribed fire applications would produce increased tree mortality. The trees killed would become surface fuels within 10 years and require another mechanical surface fuel treatment. Upon completion of that treatment, low intensity prescribed fire would occur at a 10 to 15 year cycle, maintaining the stand in desired conditions.

Modeling group 2 / Cold Upland Forest stands – Overstocked stands comprised of mostly 55 year old lodgepole (high crown fuel loadings) would require a commercial thin within 15 years. Surface fuels would be maintained at appropriate levels with a combination of mechanical fuels techniques such as mastication or grapple pile and burn. A pre-commercial thin would be required within 20 years to maintain tree densities at appropriate levels.

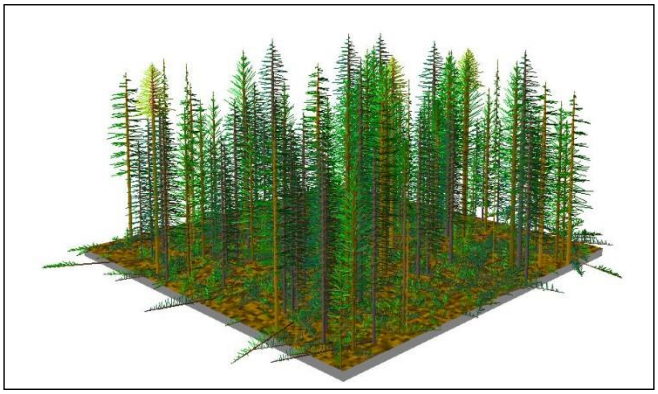
Modeling Group 3 / Moist Upland Forest – Fir dominated stand comprised of high crown fuel loadings would require a commercial thin within 15 years. Surface fuels would be maintained at appropriate levels with a combination of mechanical fuels techniques such as mastication or grapple pile and burn. A pre-commercial thin would be required within 20 years to maintain tree densities at appropriate levels.

The high density of trees remaining in the unit would prohibit grapple piling or mastication treatments from being implemented. The excess surface fuels would be hand piled to desired levels and burned late in the fall when the risk of escape would be minimal.

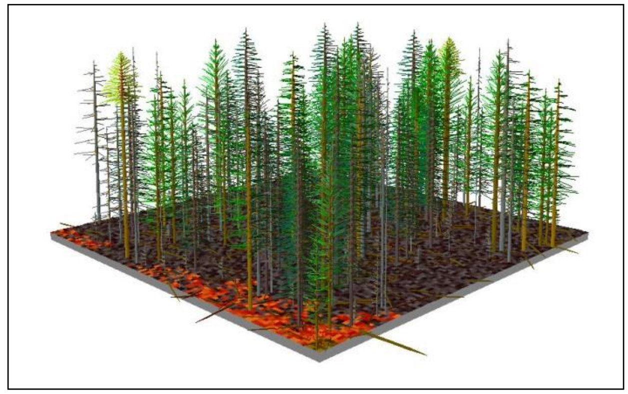
The following fire behavior simulations were created using FVS-FFE (Reference Fire Behavior Appendix). The modeling groups underwent a ladder/crown fuel reduction treatment only on tree less than 7" DBH and a post-activity treatment to reduce surface fuel loadings. Existing stand conditions data and large fire weather parameters were used to create the wildfire scenario after completion of the proposed activities. In units that have had the commercial removal deferred, crown fire potential would remain at a moderate to high level.

Group1 – Dry Upland Forest

After Thinning

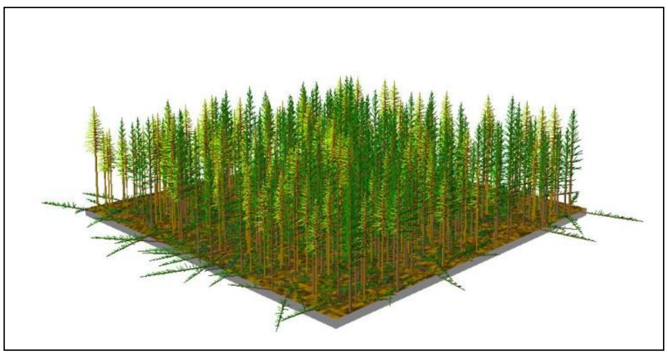


Wildfire after Treatments

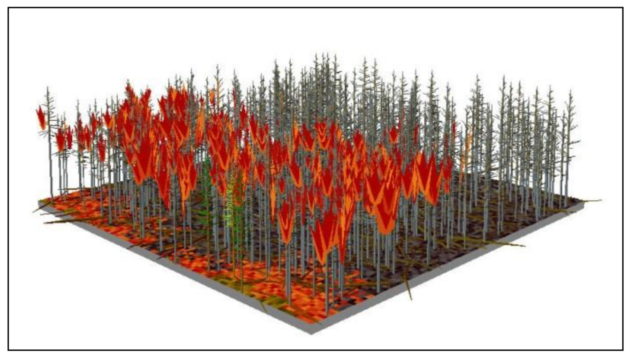


Group 2 – Cold Upland Forest

After Thinning

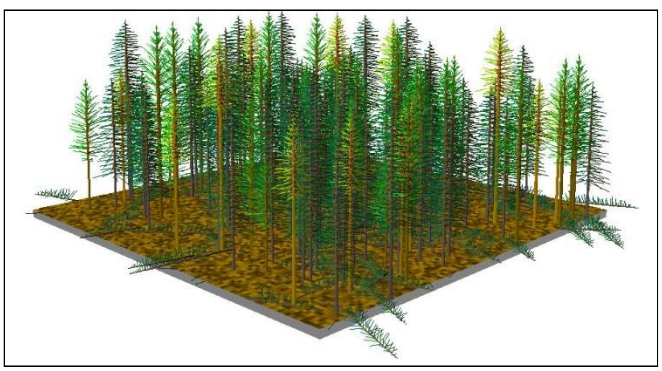


Wildfire after Treatments

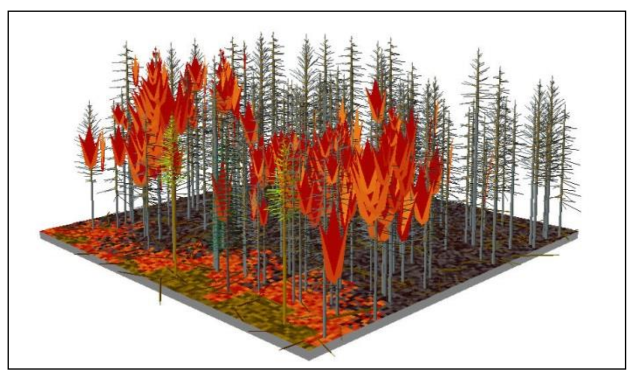


Group 3 – Moist Upland Forest

After Thinning



Wildfire after Treatments



Direct and Indirect effects of Alternative 3:

1. The proposed DFPZ's would only be partially completed. The deferral of treatments would diminish the effectiveness DFPZ's by reducing the opportunities for suppression resources to anchor their activities into pre-existing fuels treatments.
2. The probability of trees torching within treatment units is reduced through surface and ladder fuel reduction treatments. But crown fire potential still remains high in units that had commercial removal deferred due to the remaining high canopy fuel loadings (Reference Fire Behavior Appendix)
3. Wildfire intensity and severity continue increase in stands that were deferred from treatment. The risk of damaging impacts to soil, vegetation and visuals would continue.
4. Decreased forest resistance to fire, drought, and disease from high density of trees in untreated stands.
5. The deferred road maintenance would continue to prolong wildfire initial attack response times and decrease firefighter safety due poor egress routes.
6. Deferral of treatments decreases the width of the DFPZ's thus increasing probability that fire brands from torching trees will cross fire lines (reference spotting distances in the Fire Behavior Appendix)
7. Lack of a fully completed DFPZ's alters and/or delays suppression responses until control lines can be properly prepared. This delay leads to increased fire size and suppression cost, and places firefighters at risk when the work is completed as the wildfire is burning.
8. Fuels treatment costs over the next 20 to 30 years are expected to increase as biomass and tree densities continue to increase.

Summary: Fuels treatment strategies in Alternative 3 reduce surface fuels to the desired levels, but only partially decrease crown density to the desired level. Alternative 3 reduces ladder and surface fuels, thereby reducing the probability of trees torching from a wildfire initiated within the treatment unit. However deferral of treatments that reduce crown fuels (canopy bulk density) to desired levels would leave portions of the proposed DFPZ's with moderate to high crown fire potential from a wildfire that is initiated outside of the treated areas.

The elimination of 3,444 acres of treatments diminishes the effectiveness of the proposed DFPZ's. A high likelihood for fire control problems and "spotting" across fire lines would still exist due to the remaining high levels of surface, ladder and crown fuels and the resulting potential for crown fire within the proposed DFPZ's.

The deferral of treatments in units:

- 138, 139, 307, 310 and 311 leaves an untreated gap of approximately 1 mile in the proposed DFPZ adjacent to the Twin Mountain IRA and provides unobstructed pathway for wildfire to move between IRA and upper Anthony Creek drainage.
- 119, 120, 121, 122, 123, 124, 126, 128, 129, 131, 133 and 134 leaves an untreated gap along the 73 road adjacent to the Rock Creek/Bulger WUI and provides unobstructed pathway for wildfire to move from the IRA into the WUI.
- 64, 65, 66, 69 and 71 create gaps in the DFPZ along forest service road 4350.The ability to compartmentalize wildfire within the North Anthony Creek drainage is decreased.
- 93 and 95 decrease the width of the DFPZ along forest service road 4380. The decrease width of the DFPZ provides a higher probability that a fire brand will ignite a spot fire across control lines.
- 14, 15, 16, 51, 56, 58, 62 and 144 decrease the width and create gaps in the proposed DFPZ adjacent to the Beaver Creek IRA.
- 19, 21, 36 and 37 decrease the width of the DFPZ along forest service road 4315.

- 39, 40, 41, 42 and 76 decrease the width and create gaps in the DFPZ adjacent to private property thus increasing the potential that suppression actions will be implemented on state or private lands.

ALTERNATIVE 4

Alternative 4 modifies the proposed action by changing 3,878 acres of commercial activities to noncommercial and eliminates all treatments in Moist/Cold PVG in priority 3 units.

Treatments not changed from the proposed action would have the same fire behavior modeled under Alternative 2 (Table 5). Units deferred from treatment consideration under this alternative would have fire behavior similar to that modeled under Alternative 1 (Table 3). Units that were changed from commercial to noncommercial would have fire behavior similar to what is modeled under Alternative 3 (Table 7).

In the priority area 2 treatment units that changed from commercial to noncommercial no trees above 7" DBH would be removed. This noncommercial treatment removes a portion of the ladder fuels but leaves the stand with higher than desired tree densities and crown fuel loadings (Reference Table 6). Mastication treatments would be ineffective due to the amount of material needed to be treated. All project generated material would be piled and burned on site reducing the surface fuel loading to desired levels. Treatments in these units would reduce the potential for crown fire initiation by reducing surface and a portion of the ladder fuels. But deferral of the commercial treatments would leave the crown fuel loading at levels that would support a crown fire if one were to be initiated outside the treatment unit (Reference Fire Behavior Appendix).

The Upper Grande Ronde and the Beaver Creek IRA's are located adjacent to the project area. The priority 2 treatments that were designed to create DFPZ's adjacent to these IRA's are only partially effective due to remaining high canopy fuel loadings from deferral of the commercial harvest. The potential for extreme fire behavior in these areas makes it more likely that suppression resources could be overwhelmed without an adequate DFPZ's located adjacent to forest roads 43, 4330, 4350 and 7312.

Prescribed fire treatments proposed in priority 2 units that have had the commercial removal deferred would be more prone to crown fire. The crown fire potential would remain at a moderate to high level decreasing opportunities to implement prescribe fire. The elimination of offsite biomass removal increases the amount of material that is piled and burned on site resulting in increased smoke emissions, increased damage to soils and increased mortality to the desired overstory.

Direct and Indirect effects of Alternative 4:

1. A reduction of surface and crown fuels and the associated fire intensity in priority area 1 similar to the proposed action.
2. The proposed DFPZ's would only be partially completed. The deferral of treatments would diminish the effectiveness DFPZ's reducing the probability of successful fire suppression.
3. The remaining high crown fuel loadings in the stands that had commercial removal deferred would provide a high potential for a crown fire from a wildfire that is initiated outside a treatment unit.
4. Increased biomass in priority area 2 would be burned on site due to the reduction in commercial removal. Smoke emissions may be noticeable to general public for long durations (over 48 hours).
5. Increased greenhouse gasses would be released during prescribed fires due to the increased biomass burned on site.

6. Wildfire intensity and severity continue increase in stands that were deferred from treatment. The risk of damaging impacts to soil, vegetation and visuals would continue.
7. Decreased forest resistance to fire, drought, insects and disease resulting from the high density of trees remaining in the untreated stands.
8. The deferred road maintenance would continue to prolong wildfire initial attack response times and decrease firefighter safety due poor egress routes.
9. Deferral of treatments and the decrease in width of DFPZ's increases probability that fire brands from torching trees will cross fire lines.
10. Cost of firefighting would remain high with a lack of completed DFPZ's to initiate suppression actions.
11. Treatment costs over the next 20 to 30 years are expected to increase as biomass and tree densities continue to increase.

Summary: Alternative 4 reduces surface, ladder and crown fuels to desired levels in the priority 1 treatment units. Deferral of the commercial treatments that reduce crown fuels (canopy bulk density) to desired levels in priority 2 units but would leave portions of the proposed DFPZ's with moderate to high crown fire potential from a wildfire that is initiated outside of the treated areas. A high likelihood for fire control problems and "spotting" across firelines in the priority 2 areas would still exist due to the remaining high levels of ladder and crown fuels and the resulting potential for crown fire within the proposed DFPZ's.

The elimination of 3,878 acres of commercial treatments designed to reduce crown fuel loadings coupled with the prescription change reduces the effectiveness of the proposed DFPZ's. The deferral of treatments in units:

- 66, 68-73 and 424 create gaps in the DFPZ along forest service road 4350.The ability to compartmentalize wildfire within the North Anthony Creek drainage is decreased.
- 1, 11-17, 46, 48-51, 55, 57-63, 144,147 and 341decrease the width and create gaps in the proposed DFPZ adjacent to the Beaver Creek IRA.
- 19, 21, 22 and 34 decrease the width of the DFPZ along forest service road 4315.
- 74, 102, 103, 112-116, and 145 decrease the width and create gaps in the DFPZ along the 7312. This increases the potential for a fire brand from a wildfire to spot across 7312 road thus increasing the potential that suppression actions will be implemented on state or private lands.

Implementation of Alternative 4 would eliminate the option for offsite removal of excess biomass in priority 2 areas. The treatment change from commercial to noncommercial would:

- Diminish the effectiveness of the proposed crown fuel reduction treatments (trees greater than 7"DBH would not be cut).

- Increase the amount of material pile burned. It is estimated that 25 tons of biomass/acre would need piled and burned, increasing the potential for soil damage and increasing probability smoke intrusions into the local community.

The elimination of all treatments in the Moist/Cold PVG in Priority area 3 units defers stand improvement activities such as density control and species conversation designed to improve the percentage of fire tolerant trees species.

ALTERNATIVE 5

Alternative 5 modifies the proposed action to include additional ground based commercial biomass removal in PCT, WFH and WFM units. Removing biomass off site will reduce the potential for smoke impacts by eliminating the need for pile burning on 2,560 acres. The additional 938 acres of treatments added to the proposed action would increase the width of the proposed DFPZ's and improve stand health.

Treatments proposed in Alternative 5 modify vegetative structure and fuel loadings to reduce wildfire similar to what was modeled under Alternative 2 (Table 33). The DFPZ's created provide a fire suppression anchor point to reduce the potential wildfire behavior. These DFPZ's would result in the compartmentalization of the project area, providing fire managers with options to utilize confine and contain suppression strategies decreasing the potential for large wildfires.

The DFPZ's constructed adjacent to roads and the associated road maintenance would improve firefighter's response times and provide safe egress from a fire if needed.

Alternative 5 moves fire adapted ecosystems in the drier lower elevations portions of the project area towards their range of historic conditions. Fire would be reintroduced into the project area, surface fuel loadings would decrease, and the gap in vegetation profiles between historical conditions and current conditions would decrease.

The duration of the effectiveness of the fuels reduction treatments are similar to Alternative 2.

Direct and Indirect effects of Alternative 5:

1. A reduction of surface and crown fuels reduces the potential for extreme fire behavior.
2. Flame lengths would be reduced to 1-3 feet on treated acres.
3. The creation of DFPZ's in strategically sound locations to initiate suppression operations, increasing the probability of success.
4. Crown fire potential is reduced to desired levels.
5. Creation of DFPZ's in the Rock Creek Bulger and Anthony Lakes WUI decrease risks to private property and recreation residences from fire.
6. Reduction of surface and ladder fuel increases prescribed burning opportunities and decreases potential smoke emissions.
7. Creation of DFPZ adjacent to the Twin Mountain, Upper Grande Ronde and Beaver creek IRA's increases suppression options and increases firefighter safety.
8. Prescribed fire treatments would produce fewer smoke emissions and less greenhouse gasses due to the increased biomass utilization.
9. Reduced wildfire intensity and severity lessen the risk of damaging impacts to soil, vegetation, watersheds, and visuals.
10. Increased forest resistance to fire, drought, and disease from decreased density of trees.
11. The increased road maintenance would improve wildfire initial attack response times and increase firefighter safety by improving egress routes.
12. Fuels treatments would decrease the amount of smoke emissions generated from a wildfire. Smaller less intense fires would produce less smoke.

13. Creation of safe egress routes for suppression resources due to a reduced surface fuel loading adjacent to major road systems.

14. Reduced probability that fire brands from torching trees will cross fire lines constructed in DFPZ's.

Summary:

Alternative 5 meets the purpose and need of this project by using a combination of silvicultural and fuels reduction treatments designed to reduce surface, ladder and crown fuels. Thinning treatments would leave the largest, healthiest trees on site to provide shading of surface fuels and sheltering from wind. Smaller diameter tree densities would be reduced, canopy base heights raised and surface fire intensity reduced minimizing the potential for crown fire initiation. This partially shaded gap between the surface and crown fuels would reduce the potential for crown fire.

Implementation of Alternative 5 would increase the offsite removal of excess biomass by 3,499 acres. Prescription changes from noncommercial to commercial would:

- Decrease surface fuels loads to desired levels without expensive hand pile or mastication treatments.

- Decrease the amount of pile burning thus reducing the probability for smoke intrusions into the local communities.

The additional 938 acres of treatments that are added to the proposed action would increase the width of the proposed DFPZ's and improve stand health through thinning.

B. AIR QUALITY

Air resources are somewhat unique in that, the past impacts to air quality are not usually evident. While smoke emissions during summer and early fall months are primarily from wildfires and agricultural burns, smoke during the spring and later fall months primarily result from Federal prescribed fire activities (BLM and FS) in Northeast Oregon and Western Idaho. Federal land managers currently coordinate to manage the cumulative effects of prescribed burning across Northeast Oregon. Private landowners treating forest fuels in locations under the protection of Oregon Department of Forestry are required to follow the advice of the Department's smoke management forecaster when burning. Emissions data was described for the action alternatives below was derived from BlueSky Playground 2.0 beta

Other emission concerns include summer wildfires, agricultural burning, and home heating in local communities. Both wildfires and agricultural burning typically occur mid- to late-summer. Home heating is generally limited to the winter months. In all three instances, the additional emissions produced are low and are not expected to impact air quality at the time prescribed fire activities are planned.

ALTERNATIVE 1

Wildfire is a primary source of unintentional carbon emissions from forests in western United States (Stephens 2005), and can lead to widespread loss of centuries' worth of carbon storage. This effect will likely be exacerbated in coming decades under continued warming, with increasingly severe fire. Treatments in the action alternatives are designed to limit wildfire size to 500 acres or less, thus reducing emissions. Modeling was conducted to estimate the amount of greenhouse gasses that were released during the Anthony Creek to fire in 1960 to what be admitted from 500 acre fire today.

Tons of Greenhouses gasses Released
Anthony Creek Fire (15,000 acres) – 909,526 tons
500 Acre Fire within DFPZ (post treatment) – 30,317 tons

ALTERNATIVES 2 and 5

The use of prescribed fire in this area could create a short-term smoke impact. This would be transient and may last for more than 72 hours per occurrence. Prescribed burns would be planned so that factors such as wind direction and air mass stability would help limit the effects of smoke (e.g. smell, eye irritation) on local residents, campers, or the general public. In the evenings, the residual smoke would tend to follow the local wind patterns, and flow down slope into the Baker valley. Experience from several burns in the area has shown that the effects of this smoke can be minimized by controlling length and time of ignition and burning under favorable mixing conditions for smoke dispersion. Local residents would be contacted and appropriate safety signs and other methods would be used to warn motorists. Fire managers would select areas to be burned that optimize natural smoke dispersion and minimize local exposure to adverse smoke impacts.

The additional removal of biomass off site on 3,499 acres in the Alternative 5 would reduce emissions (PM10) in grapple pile units by 57% over those in Alternative 2. The additional acres of non-ground based harvest systems combined with additional acres of hand pile burning in noncommercial treatments would increase emissions of PM10 from hand pile burning by 46% in Alternative 5.

Table 36 - Projected emissions from Alternative 2 Prescribed Fire Treatments (tons)

Emission	Activity Fuels	Natural Fuels	Grapple Pile	Hand Pile	Total
PM10	872	1,003	1,139	252	**3,266**
PM2.5	753	869	977	210	**2,809**
CO	8,598	10,295	5,534	1,219	**25,646**
CO2	99,525	103,417	241,901	53,538	**498,381**
Green House Gasses (GHG's)	118,583	126,145	257,606	56,989	**559,323**

Table 37 - Projected emissions from Alternative 5 Prescribed Fire Treatments (tons)

Emission	Activity Fuels	Natural Fuels	Grapple Pile	Hand Pile	Total
PM10	941	1,003	485	471	**2,900**
PM2.5	813	869	416	393	**2,491**
CO	9,281	10,295	2,355	2,279	**24,210**
CO2	107,438	103,417	102,958	100,072	**413,885**
Green House Gasses (GHG's)	128,011	126,146	109,643	106,523	**470,323**

ALTERNATIVE 3

The elimination of offsite biomass removal increases the amount of material that is piled and burned on site resulting in increased smoke emissions, increased damage to soils and increased mortality to the remaining overstory trees.

Table 38 - Projected emissions from Alternative 3 Prescribed Fire Treatments (tons)

Emission	Activity Fuels	Natural Fuels	Grapple Pile	Hand Pile	Total
PM10	620	906	759	371	2,656
PM2.5	536	786	651	309	2,282
CO	6,119	9,306	3,687	1,792	20,904
CO2	70,838	93,485	161,193	78,702	404,218
Green House Gasses (GHG's)	84,403	114,031	171,658	83,776	453,868

ALTERNATIVE 4

Prescribed fire treatments proposed in priority area 2 units that have had the commercial removal deferred would be more prone to crown fire. The crown fire potential would remain at a moderate to high level decreasing opportunities to implement prescribe fire. The elimination of offsite biomass removal increases the amount of material that is piled and burned on site resulting in increased smoke emissions, increased damage to soils and increased mortality to the desired overstory.

Table 39 - Projected emissions from Alternative 4 Prescribed Fire Treatments (tons)

Emission	Activity Fuels	Natural Fuels	Grapple Pile	Hand Pile	Total
PM10	627	996	1373	492	3488
PM2.5	541	864	1177	410	2992
CO	6,182	10,230	6,671	2,377	25,460
CO2	71,567	102,767	291,619	104,402	570,355
Green House Gasses (GHG's)	85,270	125,353	310,552	111,132	632,307

Alternative Summary for Fire Behavior and Air Quality

Treatments proposed in all the action alternatives reduce potential fire behavior in all modeling groups; more of this occurs in Alternatives 2 and 5 than in Alternatives 3 and 4. The primary difference in Alternative 4 is the conversion of treatments to non-commercial which would not reduce the canopy fuel loadings and still leave many areas at risk. The potential for torching is reduced; fire intensity measured by flame length and rates of spread are reduced in all action alternatives over the no action alternative. Flame lengths and fire rates of spread are reduced in the action alternatives to the point that fire sizes are predicted to be less than 1 acre in size after one hour in comparison to the 59-85 acres if left untreated under Alternative 1 (Table 32). Due to the deferral of canopy fuel treatments in Alternatives 3 and 4 the potential for a crown fire remains high in portions of the proposed DFPZ's.

As described under Alternative 1 above, the ability to control a fire at 500 acres after fuel reduction treatments would produce 97% fewer greenhouse gas emissions than was released by a 15,000 acre wildfire.

Table 40 - Fire Behavior Comparison by Alternative

Indicators	Alternatives				
	1	2	3	4	5
Modeling Group 1- Dry Upland Forest					
Fire Rate of Spread (chains/hr)	48	3	6	6	3
Fire Flame Length (feet)	45	2	3	3	2
Canopy Base Height (ft)	1	21	6	6	21
Fire size 1 hour after ignition (ac)	63	.3	.9	.9	.3
Torching Index	0	496	39	39	496
Crowning Index	42	70	45	45	70
Modeling Group 2 – Cold Upland Forest					
Fire Rate of Spread (chains/hr)	52	3	3	3	3
Fire Flame Length (feet)	54	1	1	1	1
Canopy Base Height (ft)	3	9	8	8	9
Fire size 1 hour after ignition (ac)	85	.2	.2	.2	.2
Torching Index	0	255	225	225	255
Crowning Index	26	45	31	31	45
Modeling Group 3 – Moist Upland Forest					
Fire Rate of Spread (chains/hr)	43	3	5	5	3
Fire Flame Length (feet)	46	1	3	3	1
Canopy Base Height (ft)	2	14	12	12	14
Fire size 1 hour after ignition (ac)	59	.3	.7	.7	.3

Indicators	Alternatives				
	1	2	3	4	5
Torching Index	0	376	138	138	376
Crowning Index	36	52	36	36	52

Table 41 - Alternative Summary comparison on the effects of "Modifying Fire Behavior Potential"

Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Crowning Index	Crown fire Potential remains high due to the low canopy base heights, high crown fuel loadings and abundant ladder fuels.	Crown fire potential is decreased due to high canopy base heights; reduced crown fuel loadings and the elimination of ladder fuels.	The deferral of treatment units under this alternative leaves critical areas within the proposed DFPZ's with higher than desired crown fuel loadings.	The deferral of commercial activities in priority area 2 treatment units leaves the stands at risk to crown fire due abundant ladder and crown fuels remaining in the units.	Crown fire potential is decreased due to high canopy base heights; reduce crown fuel loadings and the elimination of ladder fuels.
Torching Index	The potential for torching to occur remains high due to the low canopy base heights, high crown fuel loadings and abundant ladder fuels.	Torching potential is decreased due to high canopy base heights; reduce crown fuel loadings and the elimination of ladder fuels.	The deferral of treatment units under this alternative leaves critical areas within the proposed DFPZ's with abundant ladder fuels and potential for torching.	The deferral of commercial treatments leaves stands with a high potential for torching due to the abundant ladder fuels within the treatment area.	Torching potential is decreased due to high canopy base heights; reduce crown fuel loadings and the elimination of ladder fuels.
Fire Rate of Spread	Rate of fire spread exceeds production rates of initial attack crews in direct attack methods. These conditions will continue to limit firefighting opportunities, pose undesirable risk to private property, firefighter and public safety.	Rate of fire spread is reduced to a level that initial attack crews can utilize direct attack methods. Firefighting opportunities are increased, risk to private property, firefighter and public safety are reduced.	Deferral of treatment units leaves critical areas within the proposed DFPZ's with higher than desired fire rates of spread. Increases the potential for a wild fire to escape initial attack.	Priority 2 treatment units would continue to have crown fuel loadings that are capable of producing high fire spread rates.	Rate of fire spread is reduced to a level that initial attack crews can utilize direct attack methods on an additional 938 acres. Firefighting opportunities are increased, risk to private property, firefighter and public safety are reduced.
Fire Flame Lengths	Flame lengths would exceed the ability of suppression crews to utilize direct attack options. Fire suppression tactics would be indirect thus increasing fire size.	Fire flame lengths would be reduced to 1-3 feet on treated acres. Direct fire suppression tactics decreases the potential fire size; reduce the risk to public and firefighters and private property.	Deferral of treatment units leaves critical areas within the proposed DFPZ's with higher than desired flame lengths and increases the potential for a wild fire to escape initial attack.	Surface fuels are reduced similar to Alternative 2 producing similar flame lengths. The deferral of commercial treatments leaves stands with a high crown fuel loading capable of producing intense fire behavior.	Fire flame lengths would be reduced to 1-3 feet on an additional 938 acres. Direct fire suppression tactics decreases the potential fire size; reduce the risk to public and firefighters and private property.
Canopy Base Heights	Canopy base heights remain low. Trees have a high potential to torch. and crown fire potential remains high.	Canopy base heights are increased within the DFPZ's and crown fire potential is reduced.	Deferral of treatment units leaves critical areas within the proposed DFPZ's with low canopy base heights and the potential for a crown fire is high.	Canopy base heights are increased but the lack commercial treatment leaves portions of the treatments units at risk to crown fire.	Canopy base heights are increased within the DFPZ's and crown fire potential is reduced.

Indicator	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Crown Fire Potential	Crown fire potential remains high.	Crown fire potential is reduced within the DFPZ's.	Crown fire potential remains high in the areas that were deferred from treatment.	Priority area 2 units will have crown fire initiation decreased but would still have canopy fuel loadings that would support crown fire..	Crown fire potential is reduced on an additional 938 acres.
Emissions from Fire	No prescribed fire emissions. Wildfire fires would generate large amounts of emissions due fire size and availability of fuels.	Mechanical treatments which optimize biomass utilization would decrease the amount of pollutants generated during a prescribed burn or wildfire. Smaller less intense fires would produce less smoke.	Reduction in treatment acres reduces the amount of prescribed fire emissions. Wildfire fires would generate large amounts of emissions due fire size and availability of fuels.	Reduced biomass utilization increases the amount of material burnt on site increasing the amount of prescribed fire emissions per treatment acre.	Increased biomass utilization reduces the amount of material burnt on site decreasing the amount of emissions per treatment acre.
DFPZ's / Compartmentalization of the project area.	Lack of compartmentalization exists, wildfires have a high potential to spread throughout project area. WUI's and private property are high risk from wildfire. High potential for wildfire to spread from the IRA's into the project area.	Completed DFPZ's provide a compartmentalization of the project area that would decrease wildfire size; reducing risk to private property and WUI's. Creates DFPZs adjacent to the IRA's.	Compartmentalization would be partially completed. Deferral of treatment units would create gaps in the DFPZ's.	Compartmentalization would be partially completed. Deferral of treatments and prescription changes would create gaps in the DFPZ's.	Completed DFPZ's provide a compartmentalization of the project area that would decrease wildfire size and risk to WUI's and private property. An additional 938 acres of treatments would increase the width of the DFPZ's.
IA Response Time	Responses times are delayed due to lack of road maintenance.	Response times are decreased with the proposed road reconstruction and maintenance.	Responses times are delayed due to lack of road maintenance.	Responses times are delayed in priority area 2 due to lack of road reconstruction and maintenance.	Response times are decreased with the proposed road reconstruction and maintenance.

Cumulative Effects on Fire Behavior Potential & Air Quality

ALTERNATIVE 1

The no action alternative would leave thousands of acres of public land with an existing hazardous fuels profile adjacent to private land, thus increasing the risk of a wildfire originating on forest land and spreading across ownership boundaries. Stand replacing fire events would result in the loss of old forest, wildlife habitat cover, and consumption of large woody material and structure in riparian areas. Fuels reduction treatments designed through collaborative efforts would be differed from treatment.

Values at risk including improvements, wildlife habitat, private lands, and visual concerns within and adjacent to the analysis area will continue to drive protection from disturbance events, primarily wildfire. Without treatment, fuel loading associated fire risk and fire regime departure will continue to increase, ultimately resulting in vegetative conditions that will support increasingly intense burning conditions. Climatological changes over time may compound these conditions if the predicted changes towards warmer, drier conditions come to pass. Resistance to control, suppression costs, and exposure or risk to personnel managing wildfires can be expected to increase. Similarly, managing natural ignitions for beneficial objectives will become more difficult as fire intensity increases.

ALTERNATIVES 2, 3, 4, and 5

The effects of the action alternatives contribute to the trend toward a decrease in “fire behavior potential” begun by previous treatments in the area. Ongoing projects on both public and private lands on the east face of the Elkhorn’s are very similar in types of treatments proposed in the action alternatives in this project (commercial and non-commercial thinning, improvement cuts, and surface fuels reduction treatments). In combination with the East Face project these projects increase safe firefighting options for wildfire suppression no matter where the fire originates (State, private, or federal lands (including BLM). All of these treatments are adjacent to Priority Area 1 treatments on federal lands which will improve the effectiveness of the DFPZs established in these areas. These improved DFPZs increase the probability of successful efforts to control wildfires and keep fires much smaller in size.

Grazing reduces the fine fuel loading in the natural openings improving the efficacy of fuel reduction actions in DFPZs in East Face alternatives. Active allotments may have the grass reduced to a level that reduces fire spread rates. Livestock grazing is not expected to impede progression toward historic fire return intervals.

Increasing access by opening up stands and roads may contribute to an increased potential for human caused fires within the project area. Alternatives 2 and 5 would open the most roads and build the most temporary roads; therefore, those alternatives in combination with motor vehicle use (including cross-country) would have the highest potential for increased human caused fire starts. Implementation of the travel management rule designating roads, trails, and areas for public motor vehicle use would manage cross-country motor vehicle use and provide a means of enforcement on roads and trails not designated for motor vehicle use which would reduce the potential for human cause fires in the future.

Fire wood cutting would most likely be focused on cutting in slash piles in the fuel reduction areas or untreated areas along DFPZs, this will further reduce down fuels and the potential emissions from pile burning. There is a slight chance that firewood cutting during the summer months may also contribute to potential human caused fires ignited in the project area.

La Grande Municipal water shed is adjacent to the project area. The actions proposed under this document combined with Limber Jim, Horse Fly and Ladd TSI will reduce the potential for a wildfire to burn into the watershed or stop a fire coming out of it.

ROW work by OTEC to protect the power line will enhance the proposed DFPZs which are adjacent to and surrounding the power line in the East Face project area. These treatments in combination will reduce fire behavior and improve the effectiveness of the DFPZs while protecting the power line.

The cumulative effects of ongoing and future projects, combined with the proposed activities, move several thousand acres of fire adapted plant communities (fire regimes 1 and 3) closer to historic conditions at the landscape level.

Prescribed burning in the East Face project area in combination with prescribed burning on State, private, and adjacent public lands could produce short term smoke intrusions into nearby sensitive areas. However, smoke emissions would be managed to meet the Clean Air Act on federal lands.

Summary

The proposed treatments within this document along with ongoing and proposed treatments on private, State and adjacent National Forest would reduce the potential for a large, high intensity wildfire on the East Face of the Elkhorn’s. Suppression forces would have a higher probability of successfully attacking a wildfire on public lands thus limiting fire size and the potential to spread off public lands. Treatments proposed in combination with the efforts to managing fuels on adjacent privately owned lands would decrease risks to private property and allow wildfire suppression resources to be utilized in higher priority areas throughout the forest during times of increased wildfire activity.

Climate change and fire

Climate change is a global issue that results from global Greenhouse Gas (GHG) emissions. From a quantitative perspective, there are no dominating sources and fewer sources that would even be close to dominating total GHG emissions. The global climate change issue is the result of numerous and varied sources, each of what might seem to make a relatively small addition to global atmospheric GHG concentrations. The Council on Environmental Quality recommends that environmental documents reflect this global context and be realistic in focusing on ensuring that useful information is provided to decision makers for actions that the agency finds are a significant source of GHGs. The proposed treatments under this analysis will not produce a significant amount of GHG.

While it is well documented that human activities have added greenhouse gases to the atmosphere, mainly through the burning of fossil fuels and clearing of forests, the activities proposed in this project were designed with adaptation strategies (actions that help ecosystems accommodate changes adaptively) and mitigation strategies (actions that enable ecosystems to reduce anthropogenic influences on global climate, *Milar, 2007*).

The combined effects of droughts and insects may lead to a pulse of tree mortality that increases the potential for intense fires. There are short- and long-term facets to the increase in potential fire intensity. In the short-term, warmer, drier conditions will limit the capacity of the ecosystem to maintain the quantity of vegetation currently growing on site. As this stress continues, vegetative capacity to resist insect, disease, and other disturbance mechanisms is reduced and the potential for mortality increases. Increased mortality provides additional available fuel for wildfire, thus increasing fire potential. Once the dead foliage drops, this danger may be considerably reduced for a few years. However, as the trees decay over the next decade or so following the pulse of mortality, they fall and can help create and accumulation of large, heavy fuels. These large fuels contribute to a longer-term potential for intense fires since they may take many years to decompose, especially in the dry environments of the West.

Even in the absence of increased mortality from either drought or insects, a warming climate would likely alter fire regimes in ways that would make it more difficult to manage forests influenced by many decades of fire suppression and other activities. Climate change influences fire regimes in complex ways due to differentials in responses to variation in temperature and precipitation regimes. Both tree-ring records and modeling indicate that the probability of having fires is primarily driven by temperature, whereas the extent and intensity of fires is driven more strongly by precipitation patterns. Warmer temperatures lead to an earlier onset and later end for the drying period, thus increasing the probability of a fire during the longer fire season. Precipitation influences the growth of vegetation (fuel). The amount of precipitation during the wet season will influence the amount of fuel produced.

All action alternatives manage the forest ecosystem so that it is better able to accommodate climate change and to respond adaptively as environmental changes accrue. The action alternatives encourage gradual adaption to change to a warmer and drier environment by favoring disease and fire resistant trees, reducing stand density, and lowering fuel loadings. This would reduce the potential for catastrophic conversion due to climate change driven disturbance factors that are forecasted (see Forest Vegetation section).

Adaptive strategies included within the treatment design:

1. Resistance options – manage forest ecosystems and resources so that they are better able to resist the influence of climate change or to stall undesired effects of change.

2. Promote resilience to change – resilient forests are those that not only accommodate gradual changes related to climate but tend to return toward a prior condition after disturbance either naturally or with management assistance. Promoting resilience is the most commonly suggested adaptive option discussed in a climate-change context (Dale et al. 2001, Price and Neville 2003, Spittlehouse and Stewart 2003). Forest management techniques such as prescribed burning or thinning dense forest, can make forest more resilient to wildfire and decrease fire emissions.

3. Enable forest to respond to change – This group of adaptation options intentionally accommodates change rather than resist it, with a goal of enabling or facilitating forest ecosystems to respond adaptively as environmental changes occur (Milar, 2007).

The following are mitigations strategies incorporated into treatment design:

1. Restore healthy forest so that carbon can be efficiently stored in live trees

2. Reduce emissions by reducing surface fuel loadings.

3. Reduce density of small diameter trees. One means of slowing the release of sequestered carbon is to increase forest resistance to fire, drought, and disease, by reducing the density of small trees *(Stephens and Moghaddas, 2005)*.

Wildlife – Old Growth and Landscape Connectivity

Introduction

The Wallowa-Whitman National Forest Land and Resource Management Plan (LRMP) identifies five wildlife species, or groups of species, as MIS, or Management Indicator Species (U.S. Forest Service, 1990). These species are identified because of their special habitat needs that may be influenced significantly by planned management activities, and as a result their populations can be used to indicate the health of a specific type of habitat. MIS species welfare can be used as an indicator of other species dependent upon similar habitat conditions.

Table 42 - Wallowa-Whitman National Forest Management Indicator Species

Management Indicator Species	Habitat	Presence Within Analysis Area
Rocky mountain elk	Cover and forage	Yes
American marten	Old growth and mature forest	Yes
Northern goshawk	Old growth and mature forest	Yes
Pileated woodpecker	Old growth and mature forest	Yes
Primary cavity excavators*	Snags and logs	Yes

* Northern flicker; black-backed, downy, hairy, Lewis', three-toed, and white-headed woodpeckers; red-naped and Williamson's sapsuckers; black-capped, and mountain chickadees; and pygmy, red-breasted, and white-breasted nuthatches

This section will discuss the old growth and mature forest species identified in table 42 above. Rocky mountain elk and primary cavity excavators will be discussed later in this document under Big Game and Snag and Log Habitat.

The American marten, northern goshawk, and pileated woodpecker are MIS of old growth habitat (U.S. Forest Service 1990). Old-growth habitat is categorized and analyzed in 2 categories according to the LRMP: 1) late old-growth structure; and 2) MA15 – Old-Growth Preservation. MA15 is a land allocation under the LRMP (U.S. Forest Service 1990) intended to provide quality habitat for wildlife species associated with old growth characteristics. Old growth is a structural classification used to implement direction in the Forest Plan Amendment #2 (Screens; U.S. Forest Service 1995) and refers to multi-strata stands with large trees (Old Forest Multi-Stratum- OFMS) and single-stratum stands with large trees (Old Forest Single Strata- OFSS). Although the two terms have different administrative implications, both are intended to provide habitat for old growth associated wildlife species. Old growth habitat and old growth management indicator species will be discussed separately below to provide an overview of old growth habitat in general within the project area and at the landscape scale along with the effects of the East Face project on each of the species dependent on this habitat.

Impacts to old growth and old growth dependent MIS species within the East Face project area were determined by analyzing effects to their habitat at several spatial scales starting with the watershed then framing that within the context of the Wallowa-Whitman National Forest and the Blue Mountains Ecological Province. These scales take into account the species' relationship with the landscape as well as being practical for management purposes. MIS population viability assessments have been conducted for American marten, pileated woodpecker, and northern goshawk at the Blue Mountains and WWNF. These assessments are incorporated by reference within the existing condition and effects analysis for each species. For more in-depth information on the methodology behind these assessments, please refer to the full-length assessments in the project record and the associated peer-reviewed literature scales (Penninger and Keown 2011a, Penninger and Keown 2011b, Penninger and Keown 2011c).

A. Old Growth Habitat

Background information

Declines in single stratum large trees structure (late-seral ponderosa pine) has been well documented (Wisdom et al. 2000, Squires et al. 2006), while mid-seral shade-tolerant forests seem to be at nearly twice their historical levels. These changes benefit some species but negatively affect others. The winter wren, Swainson's thrushes, pileated woodpeckers and American marten favor dense, multi-storied forests. These species are rarely associated with open ponderosa pine and open mixed-conifer types, which historically were widespread in many dry landscapes. Other wildlife species, however, such as the white-headed woodpecker and flammulated owl are associated with open, old-growth ponderosa pine (Sallabanks et al. 2001) and their populations have possibly declined as result of the loss of this forest type (Csuti et al. 1997, Wisdom et al. 2000).

Thinning reduces competition-induced- mortality in a stand, and can likely enhance habitat for species associated with late seral conditions, particularly if critical structural components, such as dead wood, are provided and if stands are managed to provide vertical and horizontal heterogeneity. Effects of thinning on a given species of wildlife may vary across a range of temporal and spatial scales. For example, large tree crowns may ultimately improve habitat for some small mammals and some species of birds to nest and forage, but increased spacing between crowns may temporarily decrease habitat suitability and inhibit dispersal. Hayes et al. (1997) states that knowledge of many species is inadequate to predict responses at multiple time frames, but it is important to consider short- and long-term as well as stand- and landscape-level perspectives when evaluating the implications of thinning.

Regional Forester Amendment #2 of June 12, 1995 established interim riparian, ecosystem, and wildlife standards for timber sales (these standards are referred to as the "Eastside Screens"). The Eastside Screens require that a range of variation approach be used when comparing historical reference and current conditions, incorporating the best available science. The range of variation approach assumes that native species have evolved with the historical disturbance regimes of an area and so a forest will continue to sustain populations of those species if current conditions fall within the historic range of variation (Powell 2010). The following range of variation analysis uses methods described in Range of Variation Recommendations for Dry, Moist and Cold Forests (Powell 2010), which is now considered the best available science. Five forest structural stages are identified within these three potential vegetation groups; Stand Initiation (SI), Stem Exclusion (SE), Understory Retention (UR) and Old Forest Single Stratum (OFSS) and Old Forest Multi Strata (OFMS).

Existing Conditions

MA-15 Old Growth Preservation-

There are 2,906 acres of MA15 allocated land in the analysis area. Suitable old growth habitat generally contains large diameter live trees, large snags and down wood; old forest multi story (OFMS) provides old growth habitat along with understory re-initiation (UR), though UR typically lacks the density of large structure.

Late Old-Growth Structure

Analysis was conducted at the project level totaling 47,636 acres. Moist old forest multi-story (OFMS) is below HRV and all potential vegetation groups (PVG) are below the historic range of variability (HRV) and deficient in old forest single-story (OFSS) (Table 43).

Table 43 - Comparison of HRV to existing by potential vegetation group (PVG) in the East Face project area

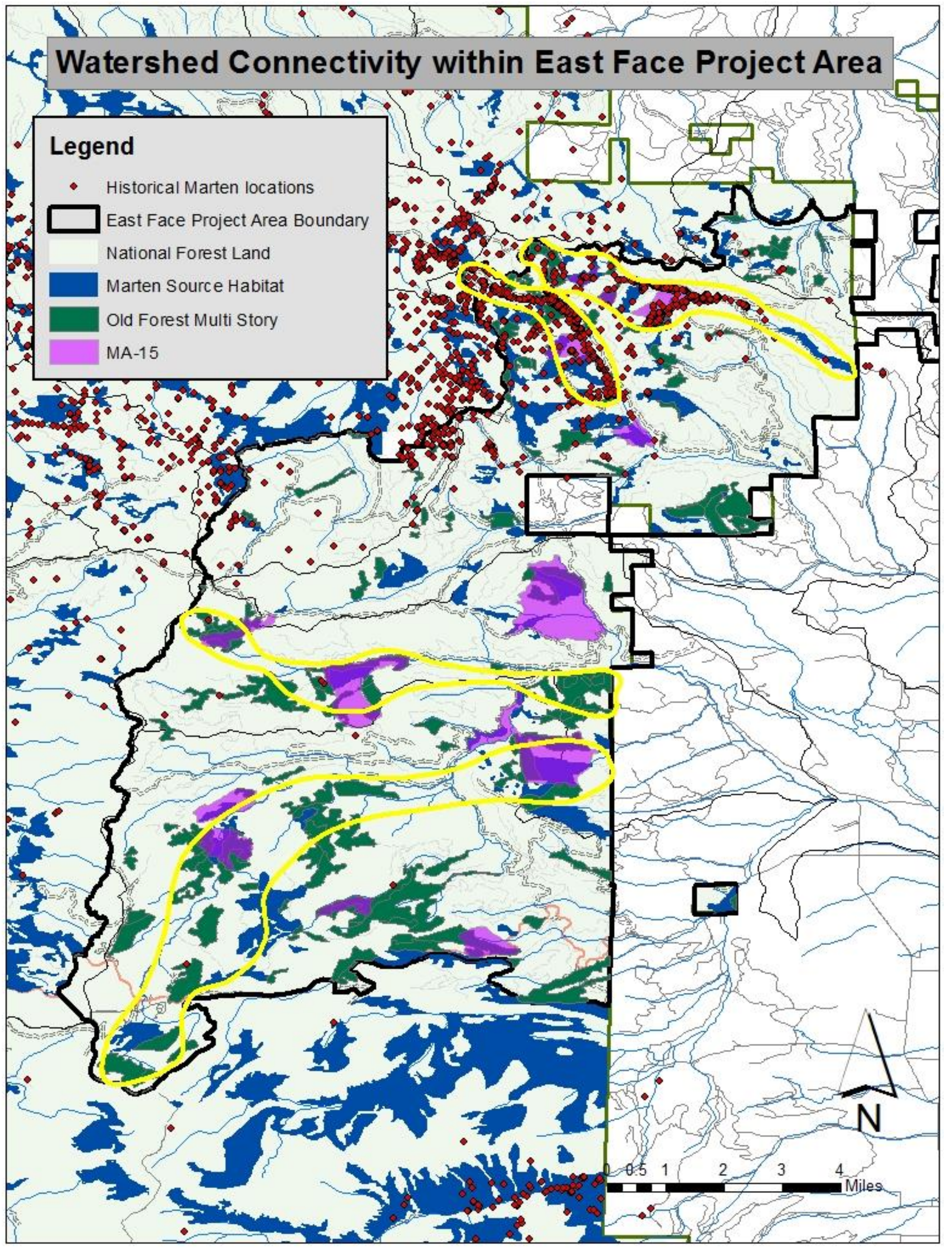
PVG	Existing Acres	% of PVG	Historical Range %
Old Forest Multi Stratum (OFMS)			
moist upland	2,277	12%	15-20%
dry upland	929	10%	5-15%
cold upland	2,574	16%	10-25%
Old Forest Single Stratum (OFSS)			
moist upland	27	0%	10-20%
dry upland	257	3%	40-60%
cold upland	392	2%	5-20%

Connectivity

According to the SCREENS Forest Plan Amendment (U.S. Forest Service 1995), connectivity corridors do not necessarily meet the same description of “suitable” habitat for breeding for old growth species, but allows free movement between suitable breeding habitats. Identifying these connective corridors ensures that blocks of habitat maintain a high degree of connectivity between them, and do not become fragmented in the short-term. Connective corridors between patches of old growth structures have been identified on a map that is on file at La Grande Ranger District. These connective corridors are small blocks of land that attempt to provide connectivity between old-growth stands at a small scale.

Distribution of OFMS stands and MA15 areas, marten source habitat (due to its identified high canopy cover) slope aspect and marten location information for verification, was used to identify watershed level landscape scale corridors and permeability (different from the fine-scale connective corridors between old-growth stands and identified by the yellow blocks on Figure 2). These corridors span the East Face project area in multiple spots and connect to the adjacent watersheds, most notably to the Grande Ronde River- Beaver Creek watershed which was the location of the majority of marten research on the Wallowa-Whitman and has been identified as an important area for marten. These corridors contain the majority of the old growth and MA15 found within the East Face project area and occur on north and north-east facing slopes with the assumption that these areas have the greatest potential for productivity and will contain the highest levels if canopy cover and multi-level complexity. These areas were built into the project design and none of the proposed treatments fragment these identified corridors. The majority of proposed fuels treatments occurs alongside these identified corridors, and by reducing the risk of wildfire, adds protection to these more complex areas that would be removed from the landscape if a wildfire entered them (Figure 2).

Figure 2 - Watershed Connectivity (identified in yellow lines) within the East Face Project Area



Effects

Assumptions

The direct and indirect effects analysis area for old growth is the 5th HUC watersheds containing the East Face project area (Wolf Creek/Powder River, North Powder River and the Grande Ronde Beaver Creek watersheds). This area is over 106,182 acres. The cumulative effects boundary for old growth habitat is the 2.4 million acre Wallowa-Whitman National Forest boundary.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on Old Growth resources.

- Roadside hazard tree removal
- Closed roads reopened for administrative access
- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement

- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to Old Growth section.

Direct/Indirect Effects on Old Growth

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Existing MA15 and old growth would be at risk if uncharacteristic wildfire and/or disease and insect outbreaks occurred. Old forest single story structure would continue to be deficient across all potential vegetation groups.

Connective Corridors

Alternative 1 would have no direct effect on connectivity between old growth patches. The current level of connectedness would persist, and would improve in quality in the absence of large scale disturbances. In the absence of treatments that would reduce stocking, the connective corridors will continue to increase in canopy closure and structural complexity. This condition in cold and moist upland forests would enhance connectivity for species like American marten. Although connectivity would be enhanced over time, risks from insects, diseases, and wild fire would increase. Conversely, dry upland forests are inherently less structurally complex than cold and moist upland forests. In the absence of silvicultural treatments to reduce stocking, the stands would continue to allow establishment of shade tolerant grand fir, increased canopy closure, and increased stress to competition for resources. In the long-term these drier stands would be subjected to increased risks from wildfire, insects and diseases that will kill trees in numbers and distribution that could negatively affect connectivity between patches of old forest single story.

ALTERNATIVES 2 and 5

Commercial

Alternatives 2 and 5 would have the same effects to old growth and will be analyzed together. Proposed commercial treatments would occur within dry, moist and cold forest types on south facing slopes. Treatments would be applied with the intent to move the stands from an OFMS stand structure to an OFSS stand structure which is deficient in all forest types. No trees over 21 inches dbh would be removed. Commercial treatments applied within old growth for Alternatives 2 and 5 include thinning treatments, improvement treatments, sanitation treatments and harvest fuels treatments.

Thinning treatments are designed to increase the growth of residual trees. Improvement treatments thin and remove undesirable trees (poor form, damaged condition, ecologically inappropriate species etc.) within a stand for the purpose of improving the growth, composition and quality of the remaining stand. Sanitation treatments prescription is designed to remove diseased and insect damaged trees and associated trees with a high potential to become infected. The trees to be removed with this prescription in East Face are a mix of Douglas-fir and western larch with mistletoe. The treatment will remove those trees with multiple mistletoe brooms and reduce the incidence of future mistletoe. The objective in these stands will be to promote non-susceptible species in the understory. For example, in stands with Douglas-fir mistletoe treatments will promote ponderosa pine and western larch. Harvest fuels treatments will remove trees creating ladder fuels and excess down dead woody material with the use commercial harvest methods. 269 acres of thinning treatments, 440 acres of improvement treatment, 41 acres of sanitation treatment, and 20 acres of harvest fuels treatments are proposed for both Alternative 2 and Alternative 5. These treatments would remove approximately 15-20% of the canopy cover but would not remove the stand from an old growth structure, instead promoting OFSS structure, a severely limited habitat in the East Face project area (Table 44). 38% of currently dry OFMS would be moved to OFSS, 5% of moist OFMS would be moved to OFSS and no commercial treatment within OFSS is proposed.

Non-commercial

1,656 acres of non-commercial treatments are proposed within OFMS and OFSS in both Alternatives 2 and 5. These treatments (hand, mechanical and pre-commercial thinning) are designed to remove ladder fuels and manage understory tree density at appropriate levels using manual methods. Ladder fuels are defined as trees (less than 9” DBH). These treatments will promote optimal conditions for prescribed fire and adds protection to the stands from the risk of severe wildfire. Canopy cover will not be affected during these treatments and the treatments would not move the stands from their current structure, but down wood would be reduced, minimizing available habitat for small mammals and hiding cover for young ungulates and mustelids. Down wood would still be maintained at Forest Plan levels (see Snag and Log Habitat section).

ALTERNATIVES 3 and 4

Commercial

Alternatives 3 and 4 would have similar effects to old growth stands (48 acre difference) and will be analyzed together. Proposed commercial treatments would occur within dry forest types and moist forest types on south facing slopes. Treatments would be applied with the intent to move the stands from an OFMS stand structure to an OFSS stand structure which is deficient in all forest types. No trees over 21 inches dbh would be removed. Commercial treatments applied within old growth for Alternatives 3 and 4 include thinning treatments, improvement treatments, sanitation treatments and harvest fuels treatments. Alternative 3 proposes 172 acres of thinning treatment and 257 acres of improvement treatments. Alternative 4 proposes 91 acres of thinning treatment, 15 acres of sanitation treatment, 351 acres of improvement treatment, and 20 acres of harvest fuels treatments. These treatments would remove approximately 15-20% of the canopy cover but would not remove the stand from an old growth structure, instead promoting OFSS structure, a severely limited habitat in the East Face project area. No commercial treatment within OFSS is proposed.

The majority of proposed treatments would take place within stands in the UR structure of all PVG types. Stand growth models indicate that managed UR stands would begin moving into old forest structure in approximately 30-50 years and so most treatments, with the exception of shelterwoods are expected to move UR stands to an old growth structure in the medium term. Alternative 4 is expected to accelerate 6,860 acres of UR to an old growth condition and Alternative 3 will accelerate 5,464 acres.

Non-commercial

918 acres of non-commercial treatments within OFMS and OFSS are proposed for Alternative 3 and 1,656 acres are proposed for Alternative 4. These treatments would promote optimal conditions for prescribed fire and add protection to the stands from the risk of severe wildfire. Canopy cover will not be affected during these treatments and the treatments would not move the stands from their current structure, but down wood would be reduced, minimizing available habitat for small mammals and hiding cover for young ungulates and mustelids. Down wood would still be maintained at Forest Plan levels (see Dead and Decayed Wood section).

Connective Corridors

Connectivity in the East Face area has been considered at two levels: a) connectivity at the landscape level and b) connectivity between stands of LOS/old growth. In general, all of action alternatives were designed to retain landscape level connective corridors (see Figure 2) which provide travel corridors through the project area from the valley to habitat in the wilderness and roadless areas surrounding the East Face project area.

Alternatives 2, 4, and 5 would slightly reduce the quality of connectivity corridors between stands of LOS in 17 units (12 commercial units, 5 fuel reduction treatment units). Treatment prescriptions in any units within LOS connective corridors would retain snags, large down wood, and multiple canopy layers (if appropriate for the site). Basal area would also be maintained within the upper half of the management zone, which would approximate canopy closures in the upper 1/3 site potential. Stocking levels would be managed at the upper management zone for basal area except where tree quality and crown conditions are such that this level of stocking is unattainable, in these areas, 20% of the stand would be retained in untreated clumps. Trees with as little as 20% live crown would be retained if needed to maintain basal area levels. All snags greater than or equal to 12 inches dbh would be retained. Down logs would be retained at 200 lineal feet per acre, minimum lengths of logs 20 feet or largest available and minimum of 12 inch small end diameter logs or largest available. Silvicultural prescriptions in connective corridor units would reduce competition between residual trees, increase tree growth rates, and increase trees' ability to defend against insects and diseases, while retaining levels of canopy closure and structural complexity to facilitate movement of wildlife between old-growth habitat patches.

Alternative 3 would impact the quality of connectivity corridors in 7 units (2 commercial units, 5 fuel reduction units). Mitigation of these units would be the same as described above. This alternative would have the least impact on LOS connectivity corridors.

Summary

Table 44 - Comparison of Old Growth Stand Structure to HRV after Proposed Treatments

Structure/PVG	HRV	Alternatives				
		1	2	3	4	5
OFMS- Moist	**15-20%**	12%	11%	12%	12%	11%
OFMS- Dry	**5-15%**	10%	5%	5%	6%	5%
OFMS- Cold	**10-25%**	16%	16%	16%	16%	16%
OFSS- Moist	**10-20%**	0.14%	0.7%	0.14%	0.4%	0.7%
OFSS- Dry	**40-60%**	3%	10%	9%	7%	10%
OFSS- Cold	**5-20%**	2%	3%	2%	3%	3%

There is no net loss of late old structure (LOS) from any of the action alternatives within the project area. All action alternatives maintain OFMS stand structure within the HRV for each PVG. While OFSS structure would remain severely below HRV in all PVGs, each of the action alternatives would move each of the PVGs toward HRV with the most acres are restored in the dry forest habitat increasing them 4-7%. The largest increase in dry PVGs is in Alternatives 2 and 5 followed by Alternatives 3 and 4 (Table 44).

Cumulative Effects on Old Growth

The existing condition of the East Face project area is a reflection of past management activities which will be taken into consideration along with the present and reasonably foreseeable future activities in the assessment of cumulative effects. Refer to Appendix D for a complete listing of present and reasonably foreseeable future projects and a compilation of the old forest (OF) acres treated in Forest Plan amendments on the Wallowa-Whitman National Forest.

ALTERNATIVE 1

There would be no cumulative effects from selecting this alternative. Any changes that would occur over time as a result of selecting this alternative would simply reflect the evolving baseline conditions for the area. Under this alternative, the project area would continue to be deficient in LOS. Past logging (selective harvest) and uncharacteristic wildfires have led to the current lack of old, big trees in the area and this alternative would perpetuate the presence of shade tolerant tree species in areas where they cannot be sustained without creating wildfire risk.

ALTERNATIVES 2, 3, 4 and 5

Of the approximately 311,730 acres of old forest (OFMS and OFSS) located on the WWNF, approximately 10,940 acres are single stratum (OFSS) and 300,790 acres are multi-stratum (OFMS). As can be seen in table 45, OFMS is within the historic range of variation across all vegetation groups; however, OFSS is well below HRV in all vegetation groups.

Table 45 – Existing WWNF OFMS and OFSS acres by PVG

PVG	Existing Structure		% of PVG		HRV	
	OFMS	OFSS	OFMS	OFSS	OFMS	OFSS
Cold Upland Forest	120,715	4,690	22%	1%	10-25%	5-20%
Dry Upland Forest	81,565	4,685	7%	<1%	5-15%	40-60%
Moist Upland Forest	98,510	1,565	19%	<1%	15-20%	10-20%

Approximately 2,682 acres (<1% if all old forest and approximately 1% of all OFMS structure) has been treated to date under previous project-specific forest plan amendments (Appendix D). Approximately 157 acres of OFMS in the Cove II WUI project were treated to reduce understory fuel loadings; however, prescriptions were modified to maintain the OFMS stand structure. The goal of the remaining 2,682 acres of past treatments were to restore stands to their historic structure, enhance the health of the stands, and provide for the habitat needs of old-growth associated wildlife species, in particular those species that rely on OFSS stand structural components. Old forest single story structure is well below the 5 – 65% historic range of variation for all vegetation groups forest-wide (Table 45). These treatments have and will maintain old growth habitat, as defined by Forest Standards, while maintaining adequate levels of down logs and snags.

Alternatives 2, 4, and 5 propose to treat approximately 62-97 acres of OFMS in dry and moist vegetation groups to reduce fuel loadings and restore it to OFSS structure, which is currently less than 1% of the forested landscape, and substantially below HRV (Table 45). The cumulative effects of implementing the plan amendment under Alternatives 2, 4, and 5 to treat OFMS stands to restore single stratum structure and composition, and maintain old forest habitat, in combination with similar past amendments on the WWNF are minor (1% of all OFMS structure), but positive relative to the extent of the restoration need Forest-wide. OFMS structure across the WWNF would remain within the historic range of variability in all vegetation groups.

Proposed commercial treatments within OFMS within the adjacent Elkhorn Wildlife Area (EWA) on State owned lands would reduce the complexity of the stand in the short term and potentially move the multi-story to a single story condition. However, there is very little OFMS structure within the EWA.

Precommercial thinning treatments on adjacent private lands simplify understory condition and long term contributes to larger average diameter; therefore, in combination with the action alternatives in the East Face project area, more acres would experience accelerated tree growth. Precommercial treatments do not remove stands from current structural stage and are not proposed within old growth on private lands. Private land commercial harvest activities are expected to continue to maximize commercial output and mitigate wildfire danger. These treatments are not expected to maintain old growth conditions and old growth habitat is expected to decrease on private land.

The effects of not treating in the stands proposed for a forest plan amendment are described under the effects discussions for Alternative 1 generally placing the area and resources at risk to loss from insects, disease, and large wildfires.

B. Old Growth Management Indicator Species

The following describes the existing conditions and effects of the East Face project on three old growth management indicator species:

Section I – American Marten
Section II – Northern Goshawk
Section III – Pileated Woodpecker

Assumptions

The direct, indirect, and cumulative effects analysis area for these old growth management indicator species is the North Powder River, Powder River-Wolf Creek and Grande Ronde River-Beaver Creek watersheds. This area is over 106,182 acres.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on old growth management indicator species.

- Roadside hazard tree removal
- Hand treatments within RHCAs
- Closed roads reopened for administrative access
- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to old growth management indicator species sections below.

I. American Marten (*Martes americana*)

Background Information

The American marten (*Martes americana,* - hereafter marten*)* is associated with mature, mesic coniferous forests and is one of the most habitat-specialized mammals in North America (Bull and Heater 2001). Martens require complex physical structure in the forest understory created by lower branches of trees, shrubs and coarse woody debris (Buskirk and Ruggiero 1994, Witmer et al. 1998, Bull and Heater 2000).

Marten in northeastern Oregon have been documented using large-diameter hollow trees and logs, accumulations of coarse woody debris, and trees with brooms for denning and resting sites (Bull and Heater 2000). 70% of martens in eastside mixed conifer forests used snags > 23.9 in dbh for denning and resting and downed wood > 20.7 in dbh for denning, resting and foraging (Mellen-Mclean et al. 2009).

Viability Determination

Wisdom et al. (2000) assessed broad-scale trends of 91 species in the interior Columbia Basin, including the marten. The historical estimate of source habitat for marten in the Blue Mountains was 8.83%, which increased to 23.5% by the 1990s. By managing habitat similar to historical conditions, it is assumed that remaining habitat will be adequate to ensure population viability because species survived those levels of habitat in the past to be present today (Landres et al. 1999).

Source habitat for marten was evaluated on the Wallowa-Whitman National Forest (Penninger and Keown 2011a) and represents the highest quality habitat which contributes to species viability. Source habitat for American marten is considered to be cold-moist and cold-dry forests with multi-stories, large tree structure and closed canopies. The threshold of ≥40% of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain ≥40% of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Not all watersheds on the Wallowa-Whitman NF have the potential to provide source habitat for marten; historically 76% of the watersheds provided source habitat and currently 68% of the watersheds provide source habitat. Although the viability outcomes for the current condition are lower than the historical, habitat is estimated to currently exist in the quality, quantity, and distribution capable of supporting a viable marten population at the Wallowa-Whitman National Forest scale.

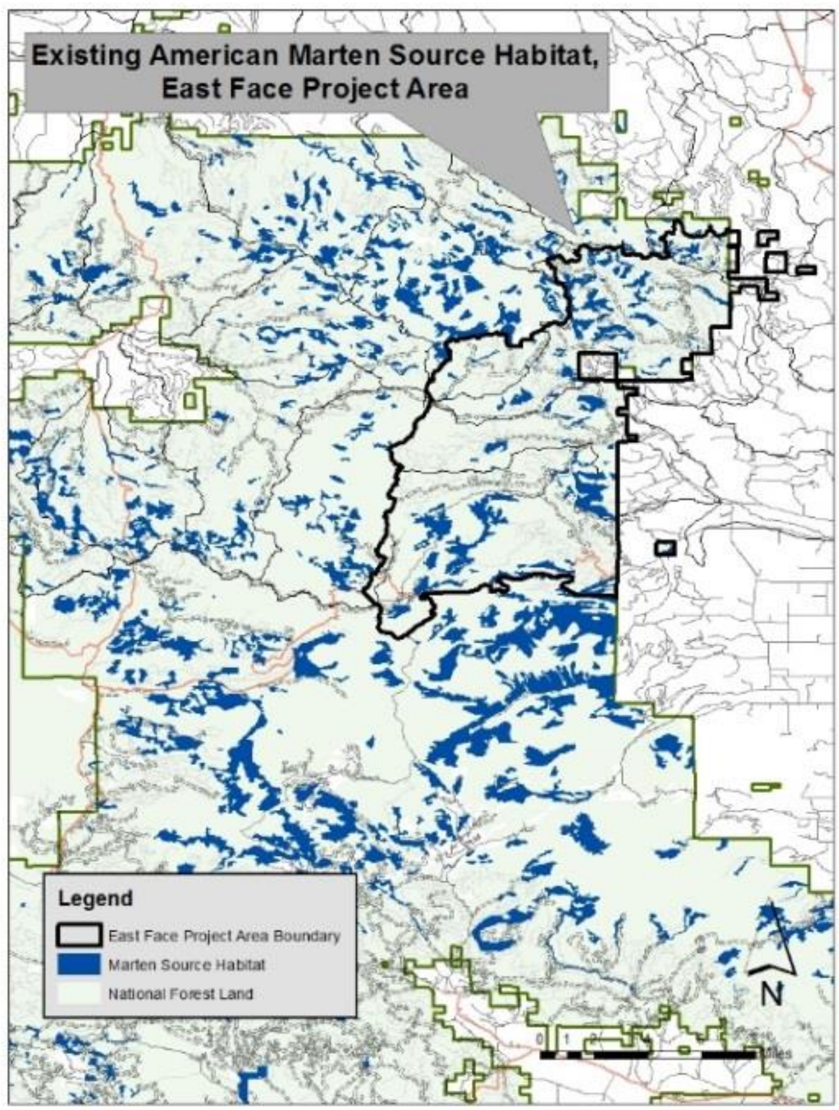


Figure 3 - Existing marten source habitat, East Face Project Area

Existing Conditions

Wolf Creek- Powder River Watershed

The northern portion of the East Face planning area lies within the Upper Wolf Creek subwatershed of the Wolf Creek-Powder River watershed (5th HUC). This watershed contains 396 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 9,335 (4%) potential acres of marten habitat. The current watershed index is 0.63 with the historic watershed index at 2.85, indicating a high historic level of habitat quality and a current low level of habitat quality and quantity. This watershed currently does not provide ≥40% of the median amount of source habitat that occurred historically, and is not above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This does not preclude marten from using the area as secondary habitat (hunting and traveling) but indicates that the majority of the habitat is not suitable for denning.

Grande Ronde River- Beaver Creek

A small portion of the northwest corner of the East Face project area lies within the Grande Ronde River-Beaver Creek watershed. This watershed contains 2,399 existing acres of marten source habitat (habitat that can support a stable or increasing population of marten) out of 33,101 (7%) potential acres of marten habitat. The current watershed index is 0.63 with the historic watershed index at 2.64, indicating a high historic level of habitat quality and a current lower level of habitat quality and quantity. This watershed currently does not provide ≥40% of the median amount of source habitat that occurred historically, and is not above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This does not preclude marten from using the area as secondary habitat (hunting and traveling) but indicates that the majority of the habitat is not suitable for denning. Research conducted by the Pacific Northwest Research Station during the mid-1900's on marten show high levels of activity within the watershed and between adjacent watersheds including the Wolf-Creek Powder River watershed. This indicates habitat quality within the Grande Ronde River-Beaver Creek watershed is higher than predicted by the model.

North Powder River Watershed

The rest of the East Face planning area lies within the Anthony Creek and portions of the Antone Creek drainages in the North Powder River Watershed. This watershed contains 4,876 existing acres of marten source habitat out of 36,557 (13%) potential acres of marten habitat. The current watershed index is 2.49 with the historic watershed index at 2.82, indicating a high historic level of habitat quality and a current high level of habitat quality and quantity. This watershed provides ≥40% of the median amount of source habitat that occurred historically, and is above the threshold necessary to support marten population viability (Penninger and Keowen 2011a). This area likely is used for hunting, traveling, and denning.

East Face Project Area

Primary source habitat for marten is defined as habitat within moist and cold upland forests in the LOS stage with ≥60% canopy closure and ≥20 inch dbh as the tree size. According to a GIS query, the East Face project area contains 3,907 acres of primary habitat, 8% of the project area (Figure 3). Marten research conducted by the Pacific Northwest Research Station performed during the mid-1990's in the adjacent Grande Ronde River-Beaver creek watershed gives a picture of marten activity within parts of the East Face project area. Tagged marten were shown moving between watersheds, primarily using habitat in the upper west corner of the project area and moving down the north facing drainages of Clark creek and Wolf creek. These drainages contain the majority of the moist OFMS found within the upper north portion of the project area. Remote sensing cameras were utilized in the summer of 2014 in areas identified as marten habitat. Marten were detected on the upper western boundary of the project, in the same area the 1990's research found marten. This verification gives weight to the assumption that marten are moving and using their habitat in a similar manner as during the time of the research study. Marten have also been picked up on remote cameras at the southern edge of the project area in the vicinity of the Anthony Lakes Ski Area.

Effects

Direct/ Indirect Effects for American Marten

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, marten and their prey would likely continue to benefit from dense stands.

Existing marten habitat may be at risk if the project area is left untreated because existing OFMS stands and MA15 stands may be lost to uncharacteristic wildfire and/or disease and insect outbreaks. If these occurred, the condition of habitat for the marten and its prey would likely decline due to a loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of over story cover would represent a long term reduction. Existing levels of snags and down wood would be at risk from uncharacteristic wildfire. The impact to marten habitat would depend on the size and severity of the disturbance.

ACTION ALTERNATIVES

Commercial treatments

Alternatives 2, 3, 4, and 5 are similar in their potential impact to marten habitat and will be analyzed together (Table 46). Of the four alternatives, a maximum of 3% of the available marten habitat within the East Face analysis area is proposed for commercial treatments. Alternatives 2, 3, 4, and 5 propose commercial treatments within 3%, 3%, 1% and 2%, respectively, of marten source habitat within the East Face analysis area. Proposed commercial treatments include sanitation treatments, improvement treatments and harvest fuels treatments. Stands that will be affected by commercial treatments are in Old Forest Multi Story (OFMS) and Understory Reinitiation (UR) structure stages.

Commercial treatments within OFMS are focused on moist forest types on south facing hillsides that historically would have been in the Old Forest Single Story (OFSS) structure stages. The treatments would reduce the canopy and simplify the structure, moving it toward OFSS. This would reduce the potential for the stand to function as source habitat for marten. Since this structure stage is considered to be ecologically appropriate in these areas, future management activities would attempt to preserve the OFSS and this would be a permanent move away from marten source habitat. Commercial treatments within UR stands would also reduce canopy cover and reduce the complexity of the stand; however, treatments within UR are designed to create healthier stands and accelerate their structure toward old growth conditions. Sanitation treatments would remove a portion of the population of mistletoe within stands targeted for this treatment, which would reduce resting and denning sites for marten (Bull & Heater 2000). The reduction in marten source habitat within these stands would be in the medium term (30-50 years). In Alternatives 2 and 4, 16 acres of improvement treatment is proposed within a connective corridor. This treatment would maintain both canopy cover and down wood at the upper management level and still provide for movement between patches of source habitat. No patch openings, which are considered barriers to marten movement, are proposed within marten habitat.

Non-commercial treatments

The greatest difference between alternatives is Alternative 3 which has a 10% reduction in non-commercial fuels treatments compared to Alternatives 2, 4 and 5 which propose treatment in ~28% of identified marten habitat (Table 46). Fuels reduction treatments include hand treatments, mechanical treatments and pre-commercial thinning. Fuel treatments do not remove canopy cover but do remove ladder fuels-small diameter trees, understory vegetation, and branches near the ground with the result of simplifying stand structure and reducing security for marten. Katie Moriarty (2014) compared marten movement within open, simple stands treated with fuels treatments and untreated complex stands. She found that martens selected home ranges with a disproportionate amount of complex stands and avoided openings. This implies that on a landscape level, only the percentage of openings affected the placement of marten home ranges; however, simple stands were marginally avoided compared to complex stands. Marten movement within simple stands vs. complex stands suggests that marten use simple stands for travel and for intermittent foraging but not for denning.

Table 46 - Comparison of affected marten habitat by Alternative (acres). Percentages within table indicate affected percentage of identified marten source habitat

Treatment Type	Acres/ Percent Habitat	Alternatives				
		1	2	3	4	5
Commercial treatments	Acres Percent Habitat	0	102 3%	102 3%	40 1%	82 2%
Non-commercial treatments	Acres Percent Habitat	0	1,072 27%	616 16%	1,056 27%	1,148 29%
Total affected acres	Acres Percent Habitat	0	1,174 30%	718 19%	1,096 28%	1,230 31%

Landscape Permeability

Identified marten source habitat, distribution of OFMS stands and MA15 areas, marten location data and slope aspect was used to identify landscape scale corridors and permeability (different from the fine-scale connective corridors between old-growth stands). These corridors span the East Face project area in multiple spots and connect to the adjacent watersheds, most notably to the Grande Ronde River- Beaver Creek watershed which was the location of the majority of marten research on the Wallowa-Whitman and has been identified as an important area for marten. These corridors contain the majority of the old growth and MA15 found within the East Face project area and occur on north and north-east facing slopes with the assumption that these areas have the greatest potential for productivity and either currently contain the necessary complexity for marten movement and denning, or have the ability to achieve that complexity in the short term. None of the proposed treatments fragment these identified corridors. The majority of proposed fuels treatments occurs alongside these identified corridors, and by reducing the risk of wildfire, adds protection to these more complex areas that would be removed as marten habitat if a wildfire entered them (Figure 3).

Cumulative Effects for American Marten

Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of marten habitat in the analysis area.

ALTERNATIVE 1

There are no cumulative effects to marten from this alternative.

ACTION ALTERNATIVES

Precommercial thinning work is proposed within the Wolf Creek Powder River watershed during 2015-2016 and is expected to have no impact on marten because the area proposed for treatment contains no suitable marten habitat. Commercial treatment and fuel reduction treatments within the Elkhorn Wildlife Area (EWA) may have an impact on marten habitat as canopy cover will be reduced and stand structure will be simplified. However, very little marten habitat occurs within the EWA. Timber harvest on private inholdings is expected to continue at some level, with anticipated reduction of trees larger than 10" dbh, but generally marten habitat does not occur on private inholdings in the East Face project area.

Conclusion

Alternatives 2, 4, and 5 propose treatments that would simplify 30% of potential marten source habitat within the East Face analysis area. The majority of these treatments would provide wildfire protection to identified landscape corridors of existing productive and complex stands for old growth dependent species. Alternative 3 proposes less fuels treatments which would simplify 10% less potential marten habitat (Table 46). This Alternative would have the least negative impact on marten source habitat, but would also marginally increase the risk of wildfire that could remove marten habitat from the landscape in the long term.

Existing marten source habitat on the WWNF as modeled by Wales (2011) totals 129,943 acres. As a result of proposed activities under the East Face project, source habitats would decline by less than 0.1% under all action alternatives. Cluster analysis used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the forest (Penninger and Keown 2011a). Post treatment availability of source habitat would continue to exceed the threshold of 40% of the historical amount in the North Powder River watershed and will continue to contribute to habitat distribution and species viability on the WWNF. Because this project impacts less than 0.1% of suitable habitat across the Forest, the overall direct, indirect and cumulative effects will result in a very small negative effect to marten habitat. The decrease in habitat quality will be insignificant at the scale of the WWNF. The East Face project will not reduce habitat permeability for marten and fuel reduction treatments will help protect important key areas of landscape connectivity.

II. Northern Goshawk

Background information

The Northern goshawk (*Accipiter gentilis*, hereafter goshawk) was chosen as a supporting indicator of abundance and distribution of mature and old-growth forests (LRMP 1990). The goshawk is associated with dense canopied mixed conifer, white fir, and lodgepole pine associations (Wisdom et al. 2000). Important habitat attributes of goshawk prey species include snags, down logs, woody debris, large trees, openings, herbaceous and shrubby understories, and an intermixture of various forest structural stages (Wisdom et al. 2000). Goshawks are prey generalists and use open understories below the forest canopy and along small forest opening to forage for mammals and small birds (Bull and Hohman 1994, Marshall 1992, Squires 2000).

Goshawks use broad landscapes that incorporate multiple spatial scales to meet their life requisites (Squires and Kennedy 2006). At least three levels of habitat scale are recognized during the breeding season: (1) a nest area, composed of one or more forest stands or alternate nests; (2) a post fledging area (PFA), which is an area around the nest used by adults and young from the time of fledging, when the young are still dependent on the adults for food, to independence; (3) a foraging area that comprises the breeding pairs entire home range (Reynolds et al. 1992, Reynolds 1983).

The nest area, or nest site, is the area immediately surrounding the nest tree, including the forest stand containing the nest tree. In general, goshawk nest areas are unique in structure, with large trees, dense and multiple canopies, and high canopy closure (>50%) primarily within mature and older forests with high amounts of down wood and snags (Finn 1994, McGrath et al. 2003).

The post fledging area (PFA) surrounds the nest area and is defined as the area used by the family group from the time the young fledge until they are no longer dependent on the adults for food (up to two months) (Reynolds et al. 1992, Kennedy et al. 1994). PFAs generally have patches of dense trees, developed herbaceous and/or shrubby understories and habitat attributes (snags, down logs, small openings) that are critical for goshawk prey (Reynolds et al. 1992). The PFA is potentially important to the persistence of goshawk populations, as it may correspond to the area defended by the breeding pair and provides fledgling hiding cover and foraging opportunities as fledglings learn to hunt.

Viability Determination

Throughout the Interior Columbia Bain, the amount of source habitat (i.e., habitat requirements to provide long term population persistence) available to the goshawk has declined from historical conditions. The greatest declines have occurred in the interior ponderosa pine and western larch forest types. It is estimated that there has been a 96% decline in old forest single-story ponderosa pine (Wisdom et al. 2000). However the interior Douglas-fir, grand fir, white fir, lodgepole pine, and juniper sagebrush have all increased in abundance from historical conditions. The overall decline in source habitat and strong decline in the ponderosa pine cover type is offset somewhat by increases in these other cover types and structural stages that provide source habitat.

Additional source habitat analysis was conducted at a finer scale on National Forest lands as part of a species viability assessment conducted in support of the Blue Mountains Forest Plan revision (Penninger and Keown 2011b). The threshold of ≥ 40% of the historical amount of source habitat in a watershed was used to identify watersheds with a relatively high amount of source habitat. Watersheds that contain ≥40% of the estimated historical median amount of source habitat are believed to provide for habitat distribution and connectivity, and better contribute to species viability across the forest. Thirty-two of the thirty-five watersheds on the Wallowa-Whitman National Forest (WWNF) which historically provided source habitat are above the historical median of source habitat providing 440,696 acres (94% of historical condition) of goshawk habitat. While the presence of roads and trails has decreased the habitat effectiveness of source habitat in most watersheds (67% in the low habitat effectiveness class) the majority of watersheds (86%) on the WWNF have high watershed index scores. High watershed index scores indicate good habitat abundance with low departure from historical conditions, and high habitat quality, with greater 50% of the source habitat being late-successional habitat.

The current viability outcome index for the WWNF show that current source habitat for the goshawk is slightly lower than for the entire Blue Mountains but is very near historical conditions, indicating that suitable habitats are broadly distributed and of high abundance, and the goshawk is likely well-distributed throughout the WWNF (Penninger and Keown 2011b).

LRMP Standards and guidelines- The Regional Forester's Eastside Forest Plan Amendment #2 (SCREENS) requires that all known and historically used goshawk nest-sites be protected from disturbance. An active nest is defined as a nest that has been used by goshawks within the past five years. SCREENS requires that a 30-acre buffer of the most suitable nesting habitat be established around every known active and historical nest tree(s), that it be deferred from harvest, and that a 400-acre post fledging area be established around every known active nest site. While harvest activities can occur within the PFA, up to 60% of the area should be retained in LOS conditions and harvest is to promote the development of LOS. Management of the PFA is intended to provide a diversity of forest conditions. Thinning from below with irregular spacing of leave trees would maintain the appropriate stand composition and structure. A seasonal restriction on logging in the PFA would be implemented during the nesting season from March 1 – September 30.

Existing Conditions

Wolf Creek/Powder River Watershed

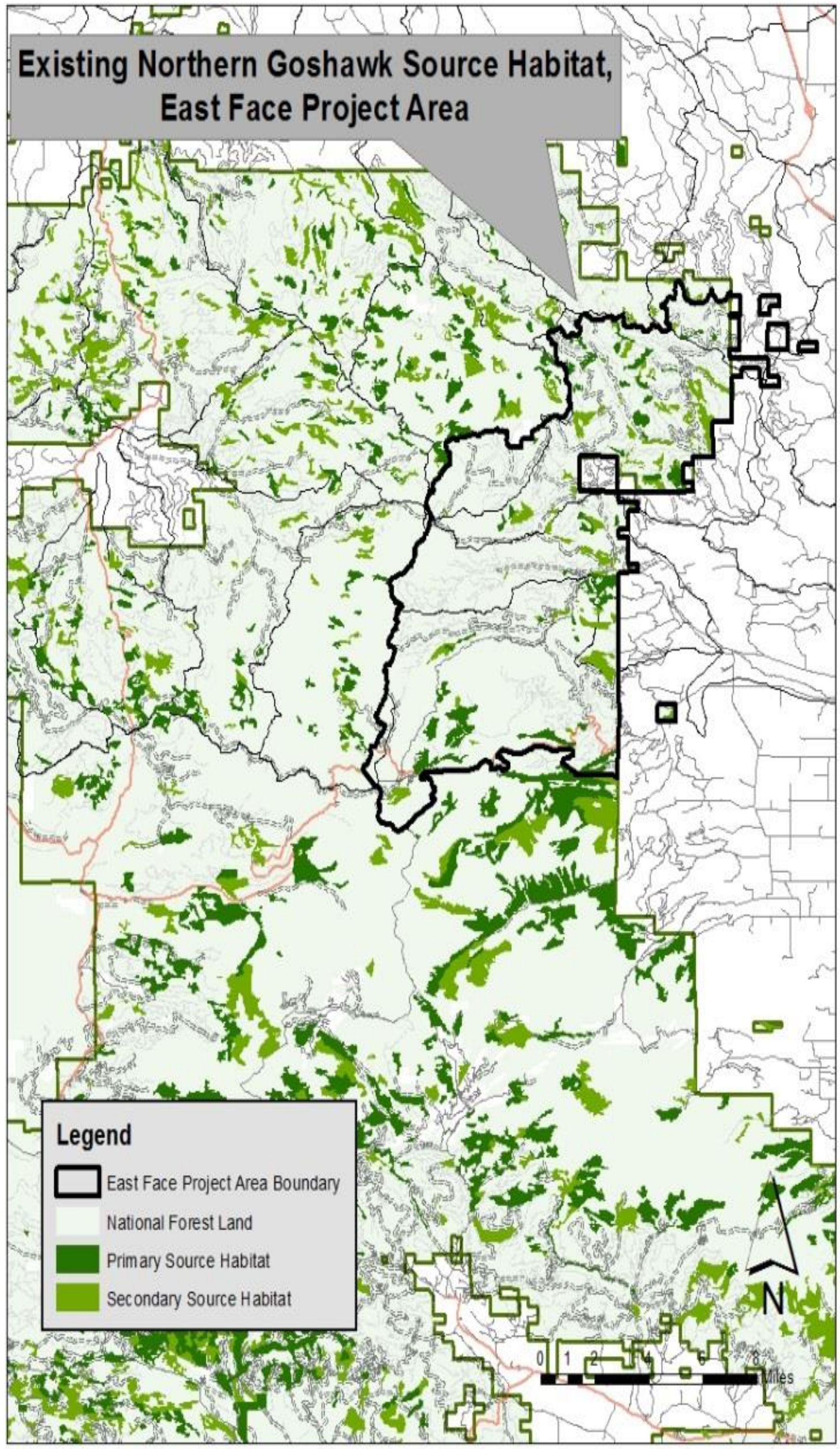
The northern portion of the East Face project area lies within the Wolf Creek/Powder River watershed (5^{th} HUC). This watershed contains 2,289 acres of existing goshawk source habitat (habitat that can support a stable or increasing population of northern goshawks) out of 13,226 acres (17%) of potential habitat. The current watershed index is 2.30 and the historical watershed index is 2.94, indicating a high level of habitat quality and quantity both currently and historically. The weighted watershed index is 2,132 indicating that this watershed provides a low contribution to goshawk population viability on the forest. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011b).

Grande Ronde River/ Beaver Creek Watershed

A portion of the north-western part of the project area lies within the Grande Ronde River/Beaver Creek Watershed. (5^{th} HUC). This watershed contains 7,956 acres of existing goshawk source habitat (habitat that can support a stable or increasing population of northern goshawks) out of 53,051 acres (15%) of potential habitat. The current watershed index is 2.48 and the historical watershed index is 2.94, indicating a high level of habitat quality and quantity both currently and historically. The weighted watershed index is 7,981, indicating that this watershed provides a medium contribution to goshawk population viability on the forest. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011b).

North Powder River Watershed

Figure 4 - Existing goshawk source habitat within the East Face Project Area



The southern portion of the East Face project area lies within the North Powder River watershed (5th HUC). This watershed contains 9,361 acres of existing goshawk source habitat (habitat that can support a stable or increasing population of northern goshawks) out of 41,811 acres (22%) of potential habitat. The current watershed index is 2.84 and the historical watershed index is 2.94, indicating a high level of habitat quality and quantity both currently and historically. The weighted watershed index is 10,759, indicating that this watershed provides a medium contribution to goshawk population viability on the forest. This watershed currently provides ≥ 40% of the median amount of source habitat that occurred historically, which is above the threshold necessary to support goshawk population viability (Penninger and Keown 2011b).

East Face project area

Northern goshawk source habitat was assessed for the East Face analysis area using four variables; potential vegetation group, canopy closure, number of canopy layers and tree size, as defined in the Northern Goshawk Management Indicator Species Assessment (Penninger and

Keown 2011). Potential vegetation groups include dry ponderosa pine, dry Douglas-fir, dry grand fir, cool moist upland forests, and cold dry upland forests. Canopy closure is generally greater than 40% in the dry vegetation types and greater than 60% in the cool and cold types. Canopy layers included both single and multi-story and tree size is defined as 15 inches dbh or greater. A GIS query found 4,958 acres of primary northern goshawk habitat (10% of the project area) (Figure 4). Audio callback transects were conducted June-August 2014 along 7 transects in identified goshawk source habitat. One goshawk was detected in the northern part of the project area.

Effects

Direct/Indirect Effects for Northern Goshawk

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Assuming no wildfires or disease/insect outbreaks, goshawks and their prey would likely continue to benefit from dense stands. Existing good goshawk habitat would be at risk if the project area is left untreated because existing OFMS and MA15 could be lost to wildfire and/or disease and insect outbreaks. If an uncharacteristic disturbance occurred, the condition of habitat for the goshawk and its prey would likely decline due to a loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of over story cover would represent a long term reduction. Existing levels of snags and down wood would be at risk from uncharacteristic wildfire. The impact to goshawk habitat would depend on the size and severity of the disturbance.

ACTION ALTERNATIVES

Commercial

Both commercial treatments and fuels treatments, including prescribed fire would occur in northern goshawk source habitat under all alternatives (Table 47). Alternatives 2, 4 and 5 propose three types of commercial treatments within identified goshawk source habitat: Harvest fuels, improvement, and shelterwood treatments. Improvement and harvest fuels treatments are expected to simplify structure and reduce canopy cover. Trees over 21 inches dbh and snags over 12 inches dbh and down wood would be maintained according to Forest Plan standards (See Decayed wood section). These types of treatments are expected to reduce certain habitat elements, such as core nest site characteristics of high canopy cover but are not expected to keep the habitat from being used by goshawks for other life history functions. Goshawk are prey generalists and forage in a variety of habitats, ranging from mature forests to open habitat adjacent to forested lands (Beier & Drennan 1997) and treated stands are expected to still provide foraging habitat.

Alternatives 2, 4, and 5 also propose 26 acres of a shelterwood treatment within goshawk source habitat. A shelterwood treatment removes the majority of trees in a stand in order to establish a new cohort of trees. Scattered overstory trees are retained to provide shade and site protection. As with all treatments, no trees over 21 inches dbh and no snags over 12 inches dbh will be removed. While goshawks potentially could use this area for foraging, the shelterwood harvest would degrade goshawk habitat more than other treatments and it would not be considered goshawk habitat until the new cohort of trees entered a late successional structural stage. All harvest treatments are expected to increase average stand diameter due to removal of trees primarily in smaller size classes, and sustainability of habitats is expected to increase as stand density reductions lower the risk of disturbance such as stand-replacement fire, especially in dry forest types.

Non-commercial

All action alternatives propose non-commercial fuel reduction treatments. These treatments are designed to remove ladder fuels and manage understory tree density by removing trees less than 9 inches dbh, pruning on some leave trees and piling of thinning slash and natural fuels concentrations. These treatments do not affect overall canopy cover or remove large trees but will simplify stands in the short term (15-20 years). These treatments will leave the habitat in source habitat condition and may improve foraging habitat. Foraging sites are typically characterized by open space between the bottom of the canopy and the top of the shrub layer and some authors have speculated that this space may increase prey availability by providing a flight path for foraging goshawks (Beier & Drennan 1997, Widen 1989).

Alternative 3 reduces the amount of commercial and non-commercial treatments in goshawk source habitat and does not propose any shelterwood treatments (Table 47). This Alternative impacts the least amount of goshawk source habitat. Alternative 5 proposes to commercially treat 12% of source habitat and non-commercially treat 20% of source habitat found in East Face. This Alternative would impact the greatest amount of goshawk source habitat.

In addition to impacts to available habitats, each action alternative poses potential for direct impact to nesting individuals. Both timber harvest and prescribed fire could cause individual harassment or mortality if operations destroy a nest tree occupied by young of the year. If goshawk nesting is discovered prior to, or during implementation, a no activity nest area of at least 30 acres will be designated for active nests. Goshawks were detected at one site during summer 2014 field reconnaissance and follow up surveys will be conducted through implementation of treatments to determine if goshawks are nesting. If a nest tree is identified, the proper treatment restrictions will be enforced (30 acres no treatment zone around nest tree).

Table 47 - Comparison of affected goshawk habitat by Alternative (acres). Percentages below indicate affected percentage of identified goshawk source habitat

Treatment Type	Acres/ Percent Habitat	Alternatives				
		1	2	3	4	5
Commercial treatments	Acres Percent Habitat	0	538 11%	276 6%	411 8%	601 12%
Non-commercial treatments	Acres Percent Habitat	0	959 19%	817 16%	1,121 23%	972 20%
Total affected acres	Acres Percent Habitat	0	1,497 30%	1,093 22%	1,532 31%	1,573 32%

Cumulative Effects for Goshawks

ALTERNATIVE 1

There are no cumulative effects to goshawks from this alternative.

ACTION ALTERNATIVES

Cumulative effects for goshawks were analyzed at the Wolf Creek Powder River and North Powder River watershed scale. Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of marten habitat in the analysis area.

Precommercial thinning work is proposed within the Wolf Creek Powder River watershed during 2015-2016 and is expected to have minimal impact on marten as it will reduce understory structure, and maintain canopy closure. Commercial treatment and fuel reduction treatments within the Elkhorn Wildlife Area will have an impact on goshawk habitat as canopy cover will be reduced and stand structure will be simplified. Timber harvest on private inholdings is expected to continue at some level, with anticipated reduction of trees larger than 10 inches dbh, and goshawk habitat within the National Forest will become more important as habitat is reduced on private lands.

Conclusion

Existing goshawk source habitat on the WWNF as modeled by Wales (2011) totals 440,696 acres. As a result of projected habitat reduction under the East Face project, source habitats at the Forest-level would decline by less than 0.3 percent under all action alternatives. Cluster analysis used to describe existing distribution of source habitats across the WWNF indicates that these habitats are well distributed across the Forest (Penninger and Keown 2011

Because this project impacts less than 0.3% of source habitat across the Forest under all alternatives, the overall direct, indirect and cumulative effects will result in a small negative effect to goshawk habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Wolf Creek Powder River, the Grande Ronde River/Beaver Creek and North Powder River watershed under all action Alternatives, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

III. Pileated Woodpecker

Background Information

The pileated woodpecker (*Dryocopus pileatus*) occurs primarily in dense mixed-conifer forest in late seral stages or in deciduous tree stands in valley bottoms. It is occasionally seen in younger stands lacking large diameter trees, particularly in winter. It is rarely found in stands of pure ponderosa pine. The association with late seral stages stems from the need for large diameter snags or living trees with decay for nest and roost sites, large diameter trees and logs for foraging on ants and other arthropods, and a dense canopy to provide cover from predators (Marshall et al. 2003).

In northeast Oregon, the pileated woodpecker shows high selection for mature, unlogged grand fir stands with ≥60% canopy closure, multiple canopy layers, and high snag density (Bull and Meslow 1988, Bull 1987, Bull and Holthausen 1993). Bull et al. (2007) found that densities of nesting pairs of pileated woodpeckers were positively associated with the amount of late structural stage forest and negatively associated with the amount of area dominated by ponderosa pine and the amount of area with regeneration harvest. Although there is a preference for dense canopy stands, high tree mortality and loss of canopy closure in stands of grand fir and Douglas-fir did not appear to be detrimental to pileated woodpecker provided that large dead or live trees and logs were abundant and that stands were not subject to extensive harvest. Pileated woodpecker densities remained steady over 30 years in areas where canopy cover dropped below 60% due to tree mortality; older stands of grand fir and Douglas-fir consisting primarily of snags continued to function as nesting, roosting and foraging habitat for pileated woodpeckers. While closed canopy forests were not essential for use by pileated woodpeckers, nest success was higher in home ranges that had greater amounts of forested habitat with ≥60% canopy closure (Bull et al. 2007).

Pileated woodpeckers feed primarily on insects in dead wood in snags, logs, and naturally created stumps (Bull and Meslow 1988, Bull et al. 1986, Torgersen and Bull 1995). Based on research data compiled in the DecAID Wood Advisor (Mellen-Mclean et al. 2012) for eastside mixed conifer forests, 70% of pileated woodpeckers in the populations studied used snags > 12.9 in. dbh for foraging. Stands with high density of snags and logs were preferred for foraging (Bull and Meslow 1977).

Viability Determination

Habitat trends of the pileated woodpecker were assessed at the Interior Columbia Basin, Blue Mountains ecological reporting unit (ERU), and WWNF scales using information provided by Wisdom et al. (2000) and the species viability assessment conducted by Wales (2011) in support of the Blue Mountains Forest Plan revision.

A fine-scale analysis of source habitat on National Forest lands in the Blue Mountains, including the WWNF was conducted in 2011 (Penninger and Keown 2011c).This analysis indicated that there has been a decline in the amount of source habitat on the WWNF from historical conditions. However, source habitat of the pileated woodpecker is still available in adequate amounts and distribution to maintain pileated species viability on the WWNF. Currently, there are approximately 206,374 acres (57% of historical condition) of source habitat on the WWNF, with twenty-nine of the thirty-five watersheds (83%) on the WWNF that historically provided source habitat, continuing to provide that habitat. Reductions of snags and the presence of roads has decreased the quality of source habitat in many watersheds but 33% of the watersheds on the WWNF have high watershed index scores, indicating good habitat abundance, moderate to high snag densities and low to moderate road densities. Additionally, 29% of the watersheds are in the moderate category. Watersheds having ≥ 40% of the median amount of source habitat are distributed across the WWNF and found in all clusters.

The viability assessment indicates the WWNF still provides for the viability of the pileated woodpecker. The pileated woodpecker is distributed across the WWNF and there are adequate amounts, quality, and distribution of habitat to provide for pileated woodpecker population viability.

Existing Condition

Wolf Creek- Powder River Watershed

The northern portion of the East Face planning area lies within the Upper Wolf Creek subwatershed of the Wolf Creek-Powder River watershed (5th HUC). This watershed contains 833 acres of existing pileated source habitat (habitat that can support a stable or increasing population of pileated woodpeckers) out of 13,120 acres (6%) of potential source habitat. The current watershed index is 0.76 and the historic watershed index is 2.63 indicating a high level of habitat quality and quantity historically and a low level of habitat quality and quantity presently. The weighted watershed index is 257, indicating the watershed provides a low contribution to pileated woodpecker population viability on the forest. This watershed does not provide ≥ 40% of the median amount of source habitat that occurred historically. Based on the amount of existing source habitat, it is estimated that this watershed has the potential to support one breeding pair of pileated woodpeckers (Penninger and Keown 2011c).

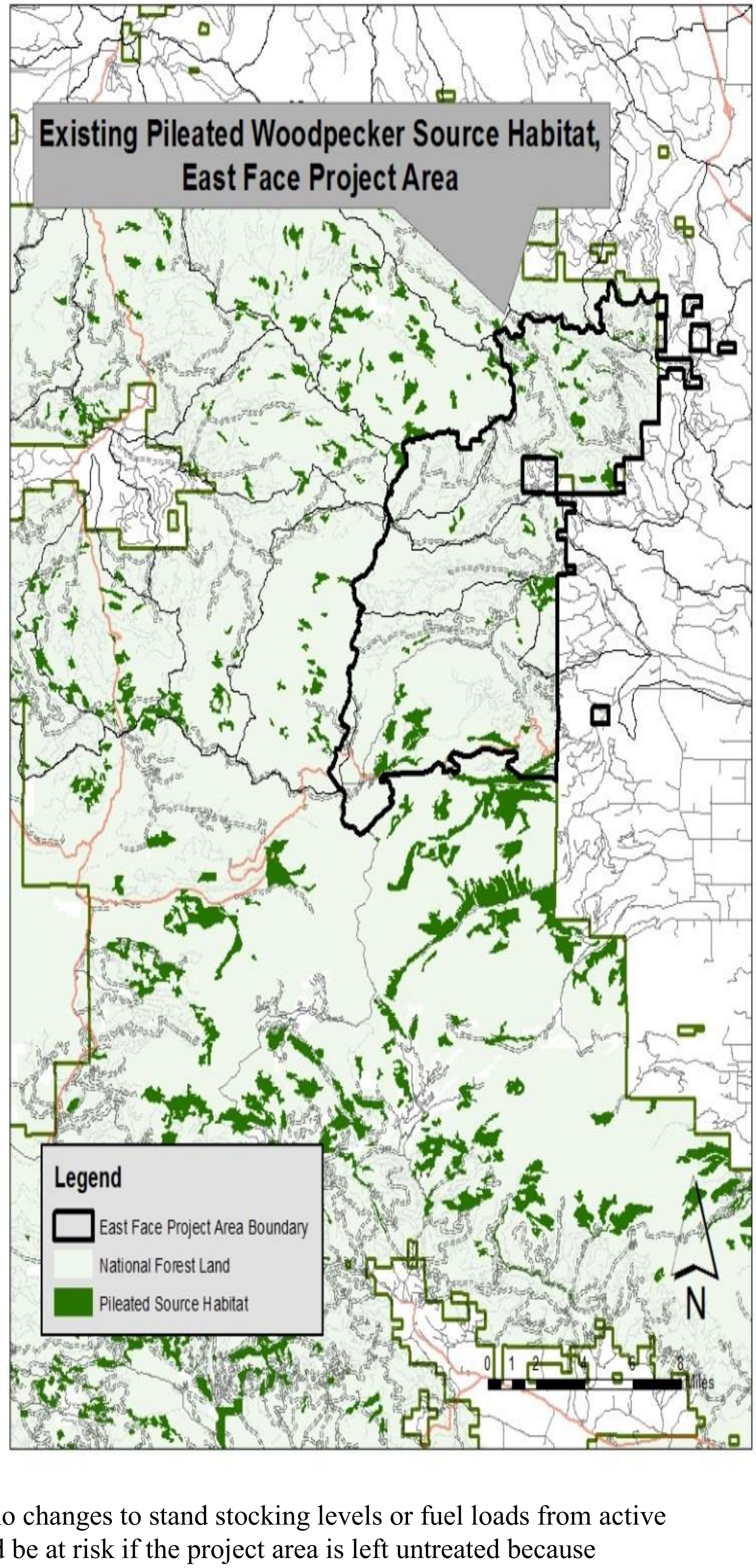
Grande Ronde River/ Beaver Creek Watershed

A portion of the north-western part of the project area lies within the Grande Ronde River/Beaver Creek Watershed. (5th HUC). This watershed contains 3,266 acres of existing pileated source habitat (habitat than can support a stable or increasing population of pileated woodpeckers) out of 48,697 acres (0.07%) of potential source habitat. The current watershed index is 0.83 and the historic watershed index is 2.63 indicating a high level of habitat quality and quantity historically and a low level of habitat quality and quantity presently. The weighted watershed index is 1,098, indicating the watershed provides a low contribution to pileated woodpecker viability on the forest. This watershed provides ≥40% of the median amount of source habitat that occurred historically, which is above the threshold to support a stable population of pileated woodpeckers. Based on the amount of existing source habitat, it is estimated that his watershed has the potential to support 4 breeding pairs of pileated woodpeckers (Penninger and Keown 2011c).

North Powder River Watershed

The southern portion of the East Face planning area lies within the Anthony Creek and portions of the Antone Creek drainages in the North Powder River watershed. This watershed contains 5,976 acres of existing pileated source habitat (habitat than can support a stable or increasing population of pileated woodpeckers) out of 41,731 acres (14%) of potential source habitat. The current watershed index is 1.97 and the historic watershed index is 2.63 indicating a high level of habitat quality and quantity historically and a medium level of habitat quality and quantity presently. The weighted watershed index is 4,776, indicating the watershed provides a medium contribution to pileated woodpecker viability on the forest. This watershed provides ≥40% of the median amount of source habitat that occurred historically, which is above the threshold to support a stable population of pileated woodpeckers. Based on the amount of existing source habitat, it is estimated that his watershed has the potential to support 8 breeding pairs of pileated woodpeckers (Penninger and Keown 2011c).

East Face Project Area



Although pileated woodpeckers will use many habitat types, successful reproduction is thought to be tied to optimum habitat, which is typically Old Forest Multi Structure (OFMS). Pileated woodpecker source habitat was assessed for the East Face analysis area using four variables; potential vegetation group, canopy closure, number of canopy layers and tree size, as defined by Penninger and Keown (2011c). Potential vegetation groups include dry Douglas fir, dry grand fir, cool moist and cold dry. Canopy closure is generally greater than 40% in the dry vegetation types and greater than 60% in the cool and cold types. Canopy layers included both single and multi-story and tree size is defined as 20 in dbh or greater. Source habitat for pileated woodpeckers within the East Face analysis area is approximately 2,506 acres, (5%) of the project area (Figure 5). The project area does not provide a large contribution to pileated population viability within the watershed. Surveys during the 2014 field season consistently found pileated sign in dry and moist OFMS and OFSS stands. Two pairs of pileated woodpeckers were identified and the nest tree will be protected.

Figure 5 - Existing pileated woodpecker source habitat, East Face Project Area

Effects

Direct/Indirect Effects for Pileated Woodpecker

ALTERNATIVE 1

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreaks would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loads from active management. Existing pileated habitat would be at risk if the project area is left untreated because existing old growth and MA15 could be lost to uncharacteristic wildfire and/or disease and insect outbreaks. Conversely, wildfire would likely also produce snags, but newly created snags are usually hard and not easily excavated. Sound live trees that are killed by fire do not contain the rot and defects that exist in snags and logs die more slowly than from other causes. The impact to habitat would depend on the size and severity of the disturbance.

ACTION ALTERNATIVES

Both commercial and non-commercial treatments will take place in pileated woodpecker source habitat under all action alternatives (Table 48). Proposed commercial treatments common to all Alternatives are improvement treatments and harvest fuel treatments. Both of these types of treatments would impact canopy closure and would degrade the source habitat in the short term, however all trees >21 inches dbh and all snags >12 inches dbh would be retained. Non-commercial treatments simplify understory structure but are not expected to reduce canopy cover or move stands from their current structure stage and will not degrade pileated habitat. However, prescribed fire has the potential to reduce snag densities by burning snags and down logs and so could degrade the habitat. Alternative 2 has the least impact on pileated woodpecker source habitat (impacts 1% of the source habitat in the project area) compared to an impact of 2% from the other 3 Alternatives. Commercial and non-commercial treatments are expected to increase average stand diameter due to the removal of trees primarily in smaller size classes and improve habitat conditions in the long term. While long-term availability of total snag numbers may decrease, available snags will, on average, be larger in treatment areas compared to untreated areas. As discussed in the Snag and Log Habitat section, snags >10 inches dbh are well represented in all density classes within Ponderosa-Pine Douglas Fir and Eastside Mixed Conifer Wildlife Habitat Types, but large snags are limiting. Retention of all snags except for safety concerns minimizes the potential for direct impacts to nesting pileated woodpeckers.

Table 48 - Comparison of affected pileated woodpecker habitat by Alternative (acres). Percentages are affected percentage of identified pileated woodpecker source habitat.

Treatment Type	Acres/ Percent Habitat	Alternatives				
		1	2	3	4	5
Commercial treatments	Acres Percent Habitat	0	43 >0.1%	43 >0.1%	22 >0.1%	55 >0.1%
Non-commercial treatments	Acres Percent Habitat	0	966 2%	538 1%	999 2%	966 2%
Total affected acres	Acres Percent Habitat	0	1,009 2%	581 1%	999 2%	1,021 2%

Cumulative Effects for Pileated Woodpeckers

Cumulative effects for pileated woodpeckers were analyzed at the Wolf Creek Powder River, Grande Ronde River/ Beaver Creek and North Powder River watershed scale. Past, present and reasonably foreseeable future actions were analyzed for cumulative impacts to the species. Effects of past activities including road construction, fire suppression, prescribed fire, woodcutting and timber management on WWNF lands have been incorporated into the existing conditions for amounts and locations of pileated woodpecker habitat in the analysis area.

Precommercial thinning work is proposed within the Wolf Creek Powder River watershed during 2015-2016 and is expected to have minimal impact on pileated woodpeckers as it will reduce understory structure, and maintain canopy closure. Precommercial thinning would reduce stress on overstory trees, creating less future snags, however model runs have shown these treatments lead to higher average diameters within stands and on average, larger snags. Commercial treatment and fuel reduction treatments within the Elkhorn Wildlife Area will have an impact on pileated habitat as canopy cover will be reduced and stand structure will be simplified, though commercial treatments are expected to result in larger snags in the long term (50+ years). Timber harvest on private inholdings is expected to continue at some level, with anticipated reduction of trees larger than 10 inch dbh, and snag removal and pileated habitat within the National Forest will become more important as habitat is reduced on private lands.

Conclusion

Alternative 5 would have the greatest impact on pileated woodpecker source habitat by proposing 1,021 acres of commercial and non-commercial treatment. Existing pileated woodpecker source habitat on the WWNF as modeled by Wales (2011) totals 129,943. As a result of East Face project activities, 0.7% of pileated source habitat across the forest would be impacted in the medium term (30-50 years). Cluster analysis is used to describe existing distribution of source habitats across the WWNF and indicate that these habitats are well distributed across the Forest (Penninger and Keown 2011c).

Because this project impacts less than 0.7% of suitable habitat across the Forest under all Alternatives, the overall direct, indirect and cumulative effects will result in a small negative effect to pileated woodpecker habitat. The loss of habitat will be insignificant at the scale of the WWNF. Post-treatment availability of source habitats would continue to exceed the threshold of 40% of the historical amount in the Wolf Creek Powder River and North Powder river watershed under all action Alternatives, thereby continuing to contribute to habitat distribution and species viability on the WWNF.

Economics

Introduction

This report analyzes the economic effects associated with the East Face Vegetation Management Project (hereafter called East Face Project). The effects of the alternatives on the local economy are discussed in terms of investments to individual projects for contracted work in terms of jobs in woods, wages associated with jobs, and the total economic output to local economies.

The economic impact analysis is used to identify potential impacts to economic conditions such as employment and income.

Existing Condition

Affected Geographic Area

The East Face Project is located within Baker and Union Counties. The counties most likely affected by the East Face Project are the five county region of northeast Oregon including Baker, Grant, Umatilla, Union and Wallowa counties. Federal land ownership in these counties is significant. For the five county region, an estimated 48.8% of the land base is federal land and 42.9% is Forest Service ownerships. See table 49 below for ownership patterns for each individual county.

Table 49 – Land Ownership by County

County	Federal Land Ownership	Forest Service Land Ownership
Baker County	1,003,987 acres (50.8%)	641,128 acres (32.5%)
Union County	602,854 acres (46.3%)	591,909 acres (45.5%)
Grant County	1,754,673 acres (60.5%)	1,578,903 acres (54.5%)
Umatilla County	444,191 acres (21.5%)	404,729 acres (19.6%)
Wallowa County	1,198,467 acres (59.5%)	1,183,938 acres (58.8%)

*Estimates from Headwaters Economics, Economic Profile System (2013 basis)

Employment Trends

In 1998, timber represented 7.9% of total employment in the local five county region. In 2013, timber representation had been reduced to 3.94% of the total employment. See table 50 below for a summary of estimated timber jobs and representation of the total workforce estimated for each county.

Table 50 – 2013 Timber Job Totals by County

County	Timber Forestry, Logging and Support	Timber Manufacturing Facilities
Baker County	13 jobs (0.3%)	187 jobs (4.8%)
Union County	104 jobs (1.5%)	427 jobs (6.1%)
Grant County	46 jobs (3.3%)	66 jobs (4.8%)
Umatilla County	20 jobs (0.1%)	452 jobs (2.1%)
Wallowa County	54 jobs (3.5%)	12 jobs (0.8%)

*Estimates from Headwaters Economics, Economic Profile System (2013 basis)

Effects

Introduction

The boundary of the direct, indirect and cumulative effects analysis area is the five county area surrounding the East Face project area boundary (Baker, Grant, Umatilla, Union, Wallowa counties). This five county area provides a potential workforce to implement the project as well as existing infrastructure and delivery points involved with wood product manufacturing.

Assumptions

The following describes the assumptions utilized for analyzing the effects of implementing the alternatives based upon estimated contract investments needed to implement planned activities of the project.

Numerous contracts will be offered to accomplish the planned ground activities identified in each alternative. It is anticipated that service contract types will be extensively utilized since the value of products will be insufficient to offset the cost of the work in all alternatives. Contracts may include a variety of work such as timber harvest activities (including costs associated with stump to truck, haul, road maintenance, reconstruction and temporary road costs), forest road improvements (fish passage culvert and bridge installation), and fuels reduction treatments. The potential investments have been incorporated into an economic model that provides a relative comparison between alternatives in terms of potential economic effects to local communities. This analysis focuses on the potential investments to implement the ground activities associated with the project and compares modeled effects on employment, wages and economic impacts within communities.

Table 51 displays costing assumptions utilized to calculate potential investments. Investment contract costs were estimated based on removal volumes for harvest type work, treatment acres of fuels/vegetation management work and treatment miles for road reconstruction work.

Table 51 – Contract Investment Assumptions and Alternative Comparison

Type of Work	Investment Value	Acres by Alternative				
		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Ground Based Logging	$150/MBF	0	17,246 MBF	10,874 MBF	6,579 MBF	19,011 MBF
Skyline Logging	$300/MBF	0	3,584 MBF	1,371 MBF	1,337 MBF	4,786 MBF
Helicopter Logging	$600/MBF	0	1,070 MBF	255 MBF	1,084 MBF	1,369 MBF
Road Reconstruction	$25,000/mile	0	53 miles	39.3 miles	27.8 miles	61.6 miles
Culvert Replacement Fish Passage	$40,000	NO	YES	YES	YES	YES
Bridge Replacement	$250,000	NO	YES	YES	YES	YES
PCT – Precommercial thin	$200/ac	0	3642 ac	3488 ac	6708 ac	1472 ac
Fuel Reduction Mechanical (GP/MP)	$400/ac	0	12,449 ac	8,587 ac	10,268 ac	9,828 ac
Fuels Reduction Biomass Removal	$1000/ac	0	0	0	0	2,560 ac
Fuel Reduction Hand work	$350/ac	0	7,286 ac	7,748 ac	9283 ac	8722 ac
Planting	$400/ac	0	257 ac	0	80 ac	257 ac

GP/MP – Grapple pile/Machine pile

Direct and Indirect Effects on Economics

ALTERNATIVE 1 – No Action

Because this alternative would not implement any of the fuel reduction activities proposed in the action alternatives there would be no investment revenue received from logging, fuels reduction, and road work within the counties surrounding the East Face project area.

ACTION ALTERNATIVES 2, 3, 4, 5

The following table summarizes the total estimated investment for each type of work and the total for each action alternative. In the table below:

> Harvest related work includes: costs associated with stump to truck (felling, yarding, loading), log haul, road maintenance, road reconstruction, and construction/obliteration of temporary road costs.
>
> Road Culvert/Bridge work includes: purchase of materials and installation of culvert and bridge including manpower and equipment.

Fuels Reduction/Vegetation Management work includes: precommercial thinning, slashbusting, grapple piling, whipfelling, planting, fuel reduction work by hand, and handpiling. Does not include prescribed burning, jackpot burning, and pile burning (these will be accomplished by the Forest Service).

Table 52 – Investments by Alternative

Alternatives	Type of Work	Expected Investment for Each Type	Total Investment
2	Harvest Related Work Road Culvert/Bridge Fuels Reduction/Vegetation Management	$7,891,601 $290,000 $10,668,450	$18,850,051
3	Harvest Related Work Road Culvert/Bridge Fuels Reduction/Vegetation Management	$4,651,141 $290,000 $8,974,900	$13,916,041
4	Harvest Related Work Road Culvert/Bridge Fuels Reduction/Vegetation Management	$3,582,574 $290,000 11,101,925	$14,974,499
5	Harvest Related Work Road Culvert/Bridge Fuels Reduction/Vegetation Management	$9,186,093 $290,000 $12,715,650	$22,191,743

Within Oregon, it is estimated that contract investments will generate between 15.7 – 23.8 jobs depending upon the work (labor intensive versus equipment intensive), as well as additional indirect jobs for each $1 million invested. (Economic and Employment Impacts of Forest and Watershed Restoration in Oregon, University of Oregon Ecosystem Workforce Program – Working Paper Number 24, Spring 2010). Direct effect employment includes those jobs created or maintained in businesses contracted to perform the work on the ground. Indirect effect employment includes those jobs associated with the demand for materials, supplies, equipment and other services needed to support the contract work.

Table 53 – Jobs by Alternative (based upon dollars invested)

Alternative	Direct Jobs	Indirect Jobs	Total Jobs
2	143.8	94.5	238.3
3	118.4	69.8	188.1
4	136.8	75.1	211.9
5	164.6	111.2	275.8

Wages would be earned as a result of the jobs produced or maintained from the contract work. Total wages earned on a project vary dependent upon the proportion hand work versus mechanical work on a project, with hand labor wages typically being lower than equipment intensive work. Table 54 displays estimated wages associated with the jobs produced.

Table 54 – Wages Earned by Alternative

Alternative	Direct Wages	Indirect Wages	Total Wages
2	$4,955,697	$3,289,886	$8,245,583
3	$3,869,618	$2,428,755	$6,298,373

Alternative	Direct Wages	Indirect Wages	Total Wages
4	$4,326,662	$2,613,485	$6,940,147
5	$5,751,882	$3,873,110	$9,624,992

Total economic activity is the value of all of the goods and services produced as a result of the project work (Direct Output) as well as through the purchase of goods and services needed to support project implementation and the value of goods and services supported by household spending of income earned during project implementation (Indirect/Induced Output). Table 55 displays the economic outputs estimated for the investments for each of the action alternatives.

Table 55 – Total Economic Output for Investments

Alternative	Direct Outputs	Indirect Outputs	Total Outputs
2	$17,312,495	$10,064,356	$27,376,851
3	$12,780,941	$7,430,001	$20,210,942
4	$10,462,712	$6,082,325	$16,545,037
5	$20,381,613	$11,848,542	$32,230,156

Summary

While Alternative 5 has the potential for the largest economic output for investments followed by Alternatives 2, 3, and 4 in that order (tables 52-55); one must consider the likelihood that adequate funds will be available to fully implement the project. Diminishing federal budgets have the potential to affect the Forests' ability to make these investments, particularly related to non-commercial fuel reduction activities. Each alternative is projected to produce a deficit sale when considering harvest related work because logging costs exceed timber values. Logging systems, road work, slash treatment and utilization levels of the harvest are the primary factors contributing to this situation. None of the alternatives will provide adequate timber value to fully implement the work; therefore, service contracts will be necessary.

Funding for fuels related service work such as those proposed in the East Face project is typically associated with hazardous fuel treatment funds. The past 10 year average annual hazardous fuel funding allocation to the Wallowa-Whitman is approximately $2.4 million. These funds support not only the federal personnel to do the planning, contract preparation and administration but also pay for the completion of the contract work. In the East Fact project, fuel reduction funding needs (table 51) for completion of the contract work alone ranges from approximately $9 million to $12.7 million. Given current funding levels, it would take approximately 10-14 years to complete the non-commercial fuels reduction work in the East Face area with no funding available for any other fuel reduction work on the remainder of the forest. Additional funding support will most likely be needed to complete all of the fuels reduction work for this project. Alternative 3 would have the least need, followed by Alternatives 4, 2 and 5 in this order.

Cumulative Effects on Economics

ALTERNATIVE 1 – No Action

The no action alternative would not contribute to the economies of the counties surrounding this project area; therefore, it has the potential to further impact the current struggles of the timber industry in northeast Oregon.

ACTION ALTERNATIVES 2, 3, 4, 5

The cumulative effect of Alternatives 2, 3, 4, and 5 are similar, they would all provide the counties surrounding the project area with receipts which otherwise would be dollars out of the taxpayers pocket. They would provide jobs as described under the direct and indirect effects above. The income generated by this project contributes to family wage earners and local industries which in turn support other local businesses, hospitals, and services contributing to the overall economic vitality of the Counties. More of this happens under Alternatives 5 and 2 than under Alternatives 4 and 3. In addition, the alternatives and the effects will be similar when considering utilization of material at manufacturing facilities. The products produced from this project under all of the action alternatives would not support the local businesses and mills alone; however, when added to the wood products being removed from other private, adjacent State, and corporate lands, as well as other national forest timber sales, it contributes to the overall viability and sustainability of local mills and businesses. The acres treated would provide seasonal work/benefits over a period of 8-10 years.

Forest Health and Sustainability

Introduction

The following describes the existing forest vegetation conditions and the effects of implementing the alternatives on forest health and sustainability in the East Face project area. Specifics of the analysis are located in the project analysis file.

Existing Condition

The Eastface analysis area is mostly roaded and has been harvested several times in the past, the most recent harvests were Black Bark Salvage, Dutch/Wolf, High Ham, Isham, Cutty Sark, and Wolf LP. The private land in the planning area has been harvested within the last few years.

Insects and Management Activities

Insects: The degree of damage from insects is variable and depends upon factors such as species composition, tree size, tree vigor and occurrence of root/bole decays. Mountain Pine Beetle, Western Pine Beetle, Spruce Beetle, Fir Engraver, Western Spruce Budworm, and Balsam Wooly Adgelid populations have shown an increase in activity the last few years. Stands have pockets of beetle kill and recent attacks.

Diseases: Tree diseases cause reduced growth rates, mortality, defect and decay. Incidence and severity of diseases in the Eastface area are a combination of vegetation, successional stage, and disturbance (Schmitt, 1994). Major diseases in the area include root diseases, indian paint fungus, lodgepole cankers, heart rots and dwarf mistletoes. Infected trees can have a reduction in growth, topkill, premature mortality, predisposition to other biotic agents and predisposition to crown fire (Schmitt, 1996). Overstocked stand conditions increase the risk of further loss of tree species.

Ninety-one percent of National Forest System lands in the East Face analysis area are forested. When classified using potential vegetation groups (PVG), approximately forty-three percent of the forested acres are “moist upland forest”, thirty-seven percent are “cold upland forest” and twenty percent of these forested lands are “dry upland forest” (Table 56).

Table 56 - Potential vegetation groups (PVG) of the East Face forested analysis area

PVG	Acres	Percent
Moist Upland Forest	19,033	43
Dry Upland Forest	8,093	20
Cold Upland Forest	16,055	37
Total	43,181	

Cold Upland Forest Group

These sites are low to moderate in productivity. This group consists of approximately 16,000 acres in the planning area and is 36% of the forested acres. Stands can be characterized by cover types which is a classification of existing vegetation. Currently, grand fir, subalpine fir and spruce, and lodgepole pine cover types make up the majority for this group. Western larch and Douglas-fir cover types are below the range of variability (Table 57). Stands proposed for treatment have: 1) considerable percentage of existing basal area in “non-releasable” suppressed and intermediate trees, 2) stand density index (SDI) values which exceed the lower management zone (LMZ) levels, or 3) tree species occurrence is outside the range of variability. Existing suppressed and intermediate crown class trees within stands proposed for density management exhibit crown ratios below 30 percent. In addition, roughly 10-20 percent of the codominant trees also display poor crown ratios. Mortality in many stands is less than 10% of the overstory. Insects and diseases observed in these stands include adelgids, several root rots, mountain pine beetle, indian paint fungus, fir engraver, and mistletoes. Stand ages for overstory greater than 9” diameter breast height (DBH) is 80 to 350 years old. Stand cover ranges from 15% to 66% with an average of 36%. This group is very susceptible to fires and can sustain stand replacement fires. Lodgepole, which in many areas is a major component of this type, is also susceptible to mountain pine beetle infestation which can become a serious problem. Understory re-iniation structure (45%) dominates in this type. Many of these stands would remain in a dense, low vigor condition until a disturbance occurs. There are 16,055 (37% of forested acres) acres of this type in the planning area.

Table 57 - Range of variation information for species composition (vegetation cover type), expressed as percentages for Cold Upland.

Vegetation Cover Type	Range of variation for cover types (percentages) (From Powell, 2012)	Existing range of cover types (percentages)
Ponderosa Pine	0-5	1
Douglas-fir	5-15	4
Western Larch	5-15	2
Lodgepole Pine	25-45	40
Grand Fir	5-15	32
Subalpine fir and spruce	15-35	21

Moist Upland Forest Group

These sites are the most productive in the Blue Mountains. The degree of damage from insects is variable and depends upon factors such as species composition, tree size, tree vigor and occurrence of root/bole decays. Species composition in these stands are a mix of species and size classes with grand fir, englemann spruce, western larch, Douglas-Fir and lodgepole pine dominating the composition with poles to large sized diameter trees. Understories are dominated by grand fir and lodgepole with twinflower and big huckleberry. Currently grand fir is the predominate cover type in these stands (Table 58). Insects and diseases observed in these stands include several root rots, mountain pine beetle, indian paint fungus, fir engraver, and mistletoes. Mortality in many stands is less than 10% of the overstory with many of the intermediate tree class exhibiting live crown ratios less then 20%. Stand ages range from 65 to 350 years old for trees greater than 9" DBH. Stand cover ranges from 19% to 67% with an average of 35%. There are approximately 2-4 snags per acre of variable species and sizes. Current structure in this type is dominated by the understory re-iniation (59%) stage. There are 19,033 (43% of forested acres) acres of this type in the planning area.

Table 58 - Range of variation information for species composition (vegetation cover type), expressed as percentages for Moist Upland

Vegetation Cover Type	Range of variation for cover types (percentages) (From Powell, 2012)	Existing range of cover types (percentages)
Ponderosa Pine	5-15	2
Douglas-fir	15-30	5
Western Larch	10-30	15
Lodgepole Pine	25-45	16
Grand Fir	15-30	52
Subalpine fir and spruce	1-10	10

Dry Upland Forest Group

These sites are low to moderate in productivity. Past activities and fire exclusion have led to an increase in the understory components of these stands, which has lead to an increase of ladder fuels into the larger trees. Historically, many of these stands were dominated by shade intolerant species maintained by fire. Species composition in these stands are a mix of ponderosa pine and Douglas-fir with some grand fir and western larch of poles to large sized trees. Understories are dominated by seedlings and saplings mostly of grand fir and Douglas-fir with pinegrass and sedges. Currently Douglas-fir is the predominate cover type in these stands (Table 59). Mortality in most stands is approximately 6% of the overstory. Stand ages range from 59 to 350 years old for trees greater than 9" DBH. Stand cover ranges from 20% to 62% with an average of 38%. There are approximately 2-3 snags per acre of variable species and sizes. Current structure in this group is dominated by the understory re-iniation (51%) stage. There are 8,903 (20% of the forested acres) acres of this type in the planning area.

Table 59 - Range of variation information for species composition (vegetation cover type), expressed as percentages for Dry Upland

Vegetation Cover Type	Range of variation for cover types (percentages) (From Powell, 2012)	Existing range of cover types (percentages)
Ponderosa Pine	50-80	19
Douglas-fir	5-20	45
Western Larch	1-10	8
Lodgepole Pine	0	10
Grand Fir	1-10	16
Subalpine fir and spruce	0	1
Unknown	--	1

Effects

Analysis Assumptions

The project area is in the geographical province of the Blue Mountains, approximately 12 miles from La Grande, Oregon. The 47,636 acre project area is the analysis area for analysis of direct and indirect effects. The cumulative effects analysis will include, subwatersheds: Baldy Creek-North Fork John Day River, Jordan Creek, Upper Wolf Creek, Middle North Powder River, Upper Ladd Creek, Upper Beaver Creek, Lower North Powder River, Upper Anthony Creek, Lower Anthony Creek), and Tanner Gulch-Grande Ronde River.

Insects and diseases can cause growth reduction, mortality, defect and decay. On an ecosystem health basis a certain level of tree insect/disease activity is expected (Schmitt 1994). Trees may be predispositioned to attack by insects or diseases by various factors including fire, overstocking, and the existing level of insects and diseases. Stand density is one of the most important factors influencing certain insect populations; dense stands increase tree competition, which increases stagnation and development of a suppressed class of trees, which can lead to outbreaks (Scott 1996). Another important factor to spread of insects/diseases is species composition. Current philosophy is to manage the level of insects/diseases and their affects, to within the range that is believed historical (Schmitt 1994). Most root diseases are believed to have increased in their virulence and occurrence in the Blue Mountains (Schmitt 2001).

Many stands in the East Face Planning Area have suppressed and intermediate trees and stocking levels exceed recommended numbers in stands across all potential vegetation groups. Overstocking and poor tree conditions can lead to an increase in beetle populations, reduced health of the stand, decreases in production of both the overstory and understory, and alter stand structures and compositions. In many instances, stress, particularly drought stress is compounded by overstocking (Fiddler et al., 1995). This stress can lead to losses in tree growth and increases in insect and disease caused mortality. Appropriate stocking levels can help to increase tree growth and fire, insect, disease resistance of stands (Lambert 1994). The number of stands treated would measure the effectiveness of the alternatives towards reducing stand density and changing species composition.

Potential Vegetation Types

Current prescriptions focus on managing stands within a range of desired densities. The lower range or lower management zone (LMZ) would maintain stocking at a point where a significant portion of the site resources are captured in tree growth. The upper range of density or upper management zone (UMZ) prevents the establishment of a suppressed tree class to develop. Stands near or above the UMZ are more likely to develop stress, be less vigorous, and contain more mortality.

According to the Intergovernmental Panel on Climate Change, there has been a clear pattern of temperature increases and long-term trends in precipitation changes (Kimbell 2007). The panel concludes that disturbances from pest, diseases, and fire are projected to have increasing impacts on forests. Climate change most typically is predicted to increase fire, drought, and greater vulnerability to insects and diseases in forests (Brown 2008). Insect life cycles are highly sensitive to temperature; climate change can have a large impact on the development, survival, and distribution of insects (Mock et.al. 2007, Redmond 2007, Brown 2008). Recent warming trends have caused mountain pine beetle infestations in areas that have not previously recorded outbreaks in British Columbia and this increase has occurred largely in part due to a shift in climate (Carroll 2004, Beukema et.al. 2007).

The impacts of climate change on most terrestrial ecosystems are expected to occur at a rate that will exceed the capacity of many plant and animal species to migrate or adapt (Kimbell 2007; Strategic Framework 2008) and create forests that are ill adapted to conditions and more susceptible to undesirable changes (Millar 2007).

To restore and maintain the landscape, silvicultural means should be used to modify and rejuvenate the forested landscape in the analysis area. Improvement cuttings, partial openings, commercial thinning, release treatments, and fuels reduction are types of silvicultural methods that can improve landscape health, reduce the risk of insect mortality and wildfire, begin to provide a range of structures for the long term, release potential of the sites, and alter species composition (Millar 2007, Kimbell 2007, Policy Statement 2007, Brown 2008, Strategic Framework 2008).

Treatments in stands, especially in the understory reinitiation stage, will anchor habitats of late and old structure across the landscape. There are several factors in the East Face Analysis Area that affect overall landscape health such as stand density, structures and species composition. These factors are major silvicultural concerns to implementing the Wallow-Whitman Forest Plan and ecosystem management.

Table 60 - Summary of Acres Treated and Volume Harvested

ALT	Total Acres	Volume (MMBF)	Prescriptions (Acres)							
			HPO	HSA	HIM	HTH	HPR	HSH	NCT*	HFU
1	0	0	0	0	0	0	0	0	0	0
2	17,098	21.9	143	210	2,200	3,563	43	318	10,376	245
3	13,654	12.5	0	62	1,198	2,437	43	0	9,775	139
4	16,500	9.0	0	122	1,255	1,154	38	120	13,656	155
5	18,036	26.3	143	210	2,886	3,816	43	318	7,815	245

*NCT = total of Non-commercial treatments (precommercial thinning, whipfelling by hand, mechanical whipfelling/mastication, and fuels reduction (FFU))

The key indicators for analysis of long term forest health are:

- Acres of overstocked stands treated within the project area
- Percent of overstocked stands treated within the project area
- Acres where species composition are trending towards HRV for species composition

Stand and landscape attributes such as density and species composition that are within the historic range of variability will assist in making the landscape more resilient and resistant to disturbances. Over the last century shifts in species composition and density have create vegetative conditions where insects, diseases, and wildfire may operate in uncharacteristic levels (Morgan and Parson, 2001).

No Direct, Indirect, or Cumulative Effects

The following activities in the action alternatives would have a negligible potential to effect forest health and resiliency:

- Danger tree removal
- Helicopter yarding
- Temporary road construction
- Mechanical control lines for burning
- Closed roads re-opened for project use
- Road decommissioning
- Road reconstruction

- Bridge replacement
- Culvert replacement

These activities will not be discussed further in this analysis.

Direct and Indirect Effects on Forest Health and Sustainability

ALTERNATIVE 1- No Action

Stands proposed for treatment under the action alternatives either have a considerable percentage of existing basal area in "non-releasable" suppressed and intermediate trees or stand density index (SDI) values which exceed the LMZ levels. Existing suppressed and intermediate crown class trees within stands proposed for density management in the action alternatives below exhibit crown ratios well below 30 percent. In addition, roughly 10-20 percent of the codominant trees also display poor crown ratios. In the absence of density management, these stands would continue to exhibit poor growth rates and crown loss due to overstocking (Cochran et.al 1994, Wyckoff et.al. 2005, Fettig et.al. 2007) and have a higher predisposition to bark beetle attacks (Cole 1988, Scott 1996, Krist et.al. 2007).

Under this alternative no stands would be treated; therefore, stocking levels, species compositions, and structural stages would remain unchanged. Alternative 1 would do nothing to mitigate the accumulation of fuels or restore ecosystem sustainability that includes the re-establishment of inherent disturbance regimes. Fire behavior indicated by rate of spread and intensity will remain unchanged until a wildfire occurs. There will be an increased risk of high-intensity wildfire through continued build-up of dead fuels. In addition to killing surviving trees and other vegetation, intense wildfire can damage the site and contribute to severe scouring of streams during peak run-off events. With this alternative an increase in multi-layering within stands and susceptibility to crown fires, spread of root diseases, dwarf mistletoe and risk of future tussock moth and western spruce budworm defoliation is anticipated. Objectives of maintaining healthy and vigorous stands capable of resisting successful insect and disease attacks would not be realized.

Cold Upland Forests

This group is very susceptible to fires and can sustain stand replacement fires. Lodgepole pine, which in many areas is a major component of this type, is susceptible to mountain pine beetle infestation which is becoming a serious problem. There is an ongoing increase of balsam wooly adelgid affecting the subalpine fir in this vegetation group. Under this alternative over 80% of this forest type would remain with high stocking densities and while the amount of grand fir would be over-represented the amount of western larch would be under-represented.

Moist Upland Forests

In moist upland forests, density related mortality will continue to increase and much of the understory component will be suppressed. Many of these stands will remain in a condition of low vigor which increases the risk of insect and disease attack or damage and reduces growth potential. Competition will also have a negative effect on the vigor of larger stand components contributing to increased mortality. Fire and insect/disease risks would not be reduced. Under this alternative, stands in the group would experience an increased spread of insect and disease (particularly root disease) damage and wildfire. Without introducing some partial openings into the stands the movement towards more seral species will be delayed until a stand disturbing event creates conditions that enable seral species to develop. Under this alternative over 60% of this forest type would remain with high stocking densities and while the amount of grand fir would be over-represented the amount of Douglas-fir and ponderosa pine would be under-represented.

Dry Upland Forests

In these stands, fir would continue to occupy parts of the stands reducing the regeneration of seral species. Without some type of disturbance these stands would continue to have an excessive fir component not historically present in this vegetation group. If left untreated these stands would continue to exhibit reduced growth rates and become more susceptible to diseases and insects. Fire and insect/disease risks would not be reduced and fuel loadings would continue to be excessive and contribute to higher fire intensities than those that would have occurred historically. Under this alternative over 70% of this forest type would remain with high stocking densities and while the amount of grand fir, lodgepole and Douglas-fir would be over-represented the amount of ponderosa pine would be under-represented.

This alternative would result in a continued decline in overall forest health as described by stand and tree health as well as, an increase in potential fire intensities. Overstocked stands would continue to be selected for haphazard stocking reduction by future insect outbreaks. The dry upland forests would continue to be in an overstocked, low vigor condition. The risk of losing these stands to mountain or western pine beetle would increase. Additional growth to trees would not be realized and movement towards larger diameter trees delayed. Moist upland forests would continue to be at risk to insect/disease damage and stand replacement fires. The desired future health and sustainability of the forest is not considered with this alternative. In all vegetation groups when species composition is outside of historic ranges as described above, resiliency is reduced making the landscape less resistant to disturbances such as insects, diseases, wildfire, and climate change impacts.

ACTION ALTERNATIVES

Alternatives 2-5 are a combination of sanitation/salvage, partial openings, commercial thinning, improvement harvests, shelterwoods, release treatments, fuels reduction activities, prescribed fire, and artificial and natural regeneration. Of the 47,636 acre project area approximately 44,620 acres are forested (94% of the project area). There are 12,534 acres in reserved lands such as allocated old growth, inventoried roadless, and riparian buffers. Of the non-reserved forested acres, 9,121 acres (28% of the available forested acres) have received a commercial entry and 2,991 acres have had a non-commercial treatment in last 35 years. (Table 61)

Table 61 - Percentage of Treatments across the Planning Area

Alternatives	Total Acres Treated	% of Total Available Acres Treated	Commercial Acres Treated	% of Available Acres Treated in East Face-Commercial	% of Available Acres Treated in Project Area-Commercial Last 35 Years
1	0	0	0	0	28
2	17,098	53	6,722	29	57
3	13,654	43	3,879	17	45
4	16,500	51	2,844	12	40
5	18,034	56	10,221	45	73

Where applicable, action alternatives would create conditions that:

- favor establishment of multi-storied stands or
- favor establishment of larch and pine
- remove ladder fuels and reduce crown densities

- reduce densities and alter species composition

Reforestation is expected to occur more quickly with the action alternatives, due to reforestation activities such as planting and adequate site preparation in comparison to the no action alternative. Created openings would remain for 10-15 years in treated stands. Woody debris would be left on the site to contribute to the nutrient cycling (long term site productivity) and enhancement of small mammal habitat. Stands not treated in the action alternatives would experience similar effects to those described in Alternative 1.

Tree density classes are expected to change in response to implementation of silvicultural activities proposed for the action alternatives. Implementing the silvicultural activities is expected to cause a consistent reduction in tree density for the treatment units to either the moderate or low density condition after implementation. Ten percent of the pre-implementation acres for medium and high density classes will remain in their density classes. (Table 62)

Tree density classes are defined as follows:

- Low Tree Density – are densities generally within the lower management zone for the species within each PVG.
- Medium Tree Density – are densities generally between the lower and upper management zones for the species within each PVG.
- High Tree Density – are densities generally near or above the upper management zones for the species within each PVG.

Table 62 – Pre- and Post-Treatment Tree Densities for Alternatives 2-5

Alternatives	Tree Density Class	Pre-Implementation		Post-Implementation		Difference Acres
		Acres	Percent	Acres	Percent	
2	Low	624	4	8,782	51	+8,158
	Medium	4,178	24	7,072	41	+2,894
	High	12,280	72	1,228	8	-11,052
3	Low	615	5	7,145	52	+6,530
	Medium	3,699	27	5,568	41	+1,869
	High	9,332	68	933	7	-8,399
4	Low	606	4	8,399	51	+7,793
	Medium	3,586	22	6,858	42	+3,272
	High	12,294	74	1,229	7	-11,065
5	Low	625	3	9,200	51	+8,575
	Medium	4,205	23	7,480	42	+3,275
	High	13,167	73	1,317	7	-11,850

Alternative 5 treats 37% of the overstocked stands within the project area while Alternatives 2 and 4 treat 34% and Alternative 3 treats 26%. Treated acres will move into the Low to Medium tree density classes reducing competition for site nutrients and improving tree vigor in the mid-term (15-20 years).

Plant species occur in either pure or mixed communities called cover types. Cover type species identified in Table 63 reflect the majority or plurality of tree species abundance. Species composition, as represented using forest cover types, is expected to change in response to implementation of silvicultural activities proposed for the action alternatives. Most of the forest cover types affected by implementation of silvicultural activities are late-seral (grand fir and spruce-fir), and they are decreased as an effect of implementation; early- or mid-seral cover types (ponderosa pine, Douglas-fir, and western larch) are either enhanced or established by these alternatives, so they are increased as a consequence of implementing the action alternatives (Table 63).

Table 63 - Change in Cover Type by Alternative

Alternatives	Cover Type	Pre-Implementation		Post-Implementation	
		Acres	Percent	Acres	Percent
2	Grand Fir	6,085	36	1,537	9
	Subalpine Fir & Englemann Spruce	1,545	9	119	1
	W. Larch	2,086	12	5,434	32
	Lodgepole Pine	3,437	20	3,226	19
	Ponderosa Pine	1,206	7	2,502	15
	Douglas-Fir	2,739	16	4,280	25
3	Grand Fir	4,111	30	830	5
	Subalpine Fir & Englemann Spruce	1,005	7	37	0
	W. Larch	2,057	15	4,276	32
	Lodgepole Pine	2,814	21	2,632	19
	Ponderosa Pine	1,186	9	2,211	17
	Douglas-Fir	2,481	18	3,668	27
4	Grand Fir	5,455	33	837	5
	Subalpine Fir & Englemann Spruce	1,133	7	208	1
	W. Larch	2,139	13	4,975	30
	Lodgepole Pine	3,513	21	3,79	21
	Ponderosa Pine	1,118	7	2,550	15
	Douglas-Fir	3,072	19	4,450	27
5	Grand Fir	6,790	38	1,951	11
	Subalpine Fir & Englemann Spruce	1,169	6	274	2
	W. Larch	2,162	12	5,338	30
	Lodgepole Pine	3,667	20	3,437	19
	Ponderosa Pine	1,206	7	2,660	15
	Douglas-Fir	3,040	17	4,374	24

Table 64 – Summary of Percent Cover Changed to Seral in the East Face Project Area

Alternative	Commercial	Non-Commercial	Total Acres Moved	Percent Upland Forest Moved
2	6,722	10,376	16,073	37
3	3,879	9,775	12,802	29
4	2,844	13,656	15,632	36
5	10,219	7,815	17,134	40

Cold Upland Forests

Intermediate treatments would remove suppressed trees and those with poor live crown ratios (LCR) (generally trees with less than 30-40% LCR) and reduce basal area to an desired stand densities.

Shelterwood harvest are in stands that have high amounts of insect and disease, few trees with greater than 30-40% live crown ratios, and severely suppressed understories. With a shelterwood harvest, the primary objective is to move the stands towards more seral species. Partial opening harvests are part of a 90 acre stand with four openings, 8 acres total. This stand is predominately lodgepole pine. The objective in this stand is to create holes that will promote early successional structure and early seral species such as western larch, western white pine as well as creating some heterogeneity.

The species composition in the cold upland forests are a mix of species and size classes with grand fir, subalpine fir, Engelmann spruce, and lodgepole pine dominating the composition with poles to medium size diameter trees. Understories are dominated by grand fir, subalpine fir, Engelmann spruce and lodgepole with twinflower and big huckleberry. Insects and diseases observed in these stands include adelgids, several root rots, mountain pine beetle, Indian paint fungus, fir engraver, and mistletoes. Mortality in many stands is less than 10% of the overstory with many of the intermediate size class trees exhibiting live crown ratios less than 30% and poor vigor.

Treatments would create a change in fire behavior by reducing the rate of spread and intensity and reduce standing and down dead fuels and ladder fuels. Treatments would reduce the risk of insect/disease problems and provide for altered fire behavior for 20-30 years.

Moist Upland Forests

The species composition in the moist upland forests are a mix of species and size classes with grand fir, Engelmann spruce, western larch, subalpine fir, and lodgepole pine dominating the composition with poles to large size diameter trees. In the overstory there is also some Douglas-fir and ponderosa pine. Understories are dominated by grand fir and lodgepole with twinflower and big huckleberry. Insects and diseases observed in these stands include several root rots, mountain pine beetle, Indian paint fungus, fir engraver, balsam woolly adelgid, and mistletoes. Mortality in many stands is less than 10% of the overstory with many of the intermediate size class trees exhibiting live crown ratios less than 20% and poor vigor.

Reducing stand densities by improvement cuttings, thinnings, sanitation, shelterwoods, partial openings, and fuels treatments will enhance stand and landscape health. Sanitation would provide for regeneration to develop with non-susceptible hosts. Improvement harvests, thinnings and fuels treatments will reduce densities and provide for a more vigorous and healthy stands. Shelterwood harvest are in stands that have high amounts of insect and disease, few trees with greater than 30-40% live crown ratios, and mostly suppressed understory. With a shelterwood harvest, the main objective is to move stands towards more seral species which are underrepresented on the landscape leaving the existing stands an overstocked monoculture which places them at a higher risk to insect and disease attack.

Partial opening harvests are in stands that are predominately lodgepole pine with some associated species, the objective in these stands is to take approximately 10% of the stand and create small holes that will promote early successional structure and early seral species such as western larch, western white pine as well as creating some heterogeneity in stands. Patch treatments would create forests with canopy openings that reflect fine-scale disturbances and increase resilient to insects, disease, wildfire and climate change (Jain, 2008). Early seral species, such as western white pine and western larch are long lived species that can regenerate and persist in patches (Kolb 2004). Proposed treatments will create conditions that will encourage higher amounts of early and mid-seral trees species (western white pine, western larch, ponderosa pine) and decrease the amount of grand fir, lodgepole pine, and subalpine fire. Western larch and western white pine will lose dominance to shade tolerant species in partial shade (Fowells, 1965). The overall objective is to reduce the amount of suppressed trees, ladder fuels, mistletoe infected western larch and increase the amount of western white pine, western larch, and ponderosa pine. Treatments will maintain dominates and co-dominates with 30-40% live crown ratio and reduce basal area to 40 square feet/acre. These treatments will produce visible sky that will enable western white pine and western larch to be competitive. Western white pine maintains a competitive advantage with greater than 50% visible sky and is free to grow at 92% visible sky when density is reduce to less than 66 square feet of basal area per acre (Jain, 2008). Growth can be sacrificed if openings are less than 10 acres but western white pine can persist in these small openings (Jain, 2008).

Treatments would cause a change in fire behavior by reducing the rate of spread and intensity and would reduce standing and down dead fuels and ladder fuels. Treatments will alter the amount of grand fir in the stand and promote more seral species. In moist upland forest, grand fir was typically 15-30% of the stand composition (Schwalbach 2011) currently; grand fir is the majority in 52% of the stands is this potential vegetation group.

Dry Upland Forests

Treatments in this type would provide more disease resistance and structures more consistent with natural disturbance regimes (Schmidt 1994; Scott 1996; Schowalter and Withgott 2001). Many of these stands would begin to provide more open conditions dominated by ponderosa pine, Douglas-fir, and western larch. The effects of potential climate-induced change will be minimized by reducing densities and minimizing grand fir. Post-harvest burning of these stands would play an important role in maintaining them. Density levels, as well as, the amount of understory in the stands would be reduced as burning is conducted. Treatments would reduce the risk of insect/disease problems and provide stocking control for 20-30 years.

Natural underburning conducted in fire-dependent ponderosa pine and fire-tolerant mixed conifer stands will help to perpetuate natural disturbance regimes.

Two major changes expected from climate change are more severe fire and extensive outbreaks of insects and diseases (Brett, 2008). Climate change is elevating the level of insect and disease caused mortality and impacting the size and extent of wildfires. In response to those changes the strategy is to develop more resilient and resistant forests. Changing species composition from one susceptible to insects and diseases and fire to one more resistant and resilient will provide for sustainability of forests. A healthy forest has a majority of trees that are vigorous and resistant to insects and disease and have the ability to sustain itself when affected by wildfire. Treatments would provide for altered fire behavior for 20-30 years.

Summary

The overstocked stand conditions can have a major effect on landscape health and attaining the desired future condition (DFC) for the East Face Analysis Area. In a healthy landscape there are areas of high density and low vigor, but to develop the DFC for much of the area, many of those stands need to be treated. To move towards a more healthy stand and landscape condition forest management needs to occur. Alternative 1 leaves the landscape in its current condition and carries with it a high risk of stand and landscape decline. Alternatives 2-5 would reduce densities, alter stand compositions and provide for a more sustainable landscape. Alternatives 5, 4, and 2 move the most acres toward low to moderate tree densities (Table 62); however, because Alternative 4 would non-commercially treat more of the managed acres than Alternatives 2 and 5, it would have more acres at the medium to high stocking densities due to removal of the small understory trees and retention of more overstory trees. Non-commercially treated stands in Alternative 4 would require another entry to manage stocking densities within the next 5-8 years whereas Alternatives 2 and 5 would hold for a longer period of time before further density management is needed to maintain stand health and vigor. Alternative 3 would have the least number of acres into low to medium tree density classes.

Alternatives 5 and 2 would have the highest species composition percent change (40% and 37%) toward more resilient seral species than Alternatives 3 and 4 (29-36%) (Table 64). Stand species compositions that are within the historic range of variability assist in making the landscape more resilient and resistant to disturbances. Over the last century shifts in species composition and density have create vegetative conditions where insects, diseases, and wildfire may operate in uncharacteristic levels (Morgan and Parson, 2001). Stand management in the East Face action alternatives would be a start toward creating a more resilient landscape by managing stand densities, species composition, and creating some heterogeneity in homogeneous areas.

As management occurs, the desired future condition of the area is to use the natural disturbance regime as a template to provide for a structure, density, and species composition mix across the landscape that is sustainable. This mixture will provide a degree of diversity for big game and other wildlife and a level of wood fiber and forage production.

Common Effects

Common to most harvest units are INFISH no-harvest buffers. Many of the no-harvest buffers have adequate regeneration, healthy trees and minimum amounts of mortality. Long term implications of these no-harvest buffers are minimized by site conditions. However, some density related mortality is expected and should provide for riparian needs.

In most units snag levels will be met by retaining all existing snags. Maintaining these snags should have no adverse silvicultural effects.

Connective corridors will be maintained in the planning area. Corridors have certain requirements about distance and canopy closure. Stands treated with corridor requirements will tend to have higher densities and tree numbers that will increase density mortality, be less vigorous, and be at higher risk to fire damage.

Enhancement and KV projects and mitigation measures are part of all action alternatives, silvicultural effects of each follow:

1) Release Treatments (Non-commercial Thinning): will have positive silvicultural effects by reducing competition, increasing growth rates and helping to maintain species composition.
2) Prescribed Burning and Mechanical Fuels Reductions: burning and fuels reduction treatments will provide for additional openings within stands to assist natural and artifical regeneration and reduce the possibility of a fire damaging the residual stand.
3) Planting: will have positive silvicultural effects by providing: regeneration in stands that have few viable seedlings or saplings, structural component that is lacking in some stands, and tree densities at appropriate numbers.
4) Fire Fuels Reduction (FFU): biomass removal of down and suppressed material will have positive silvicultural effects by reducing the risk of future fires with the chance of a stand replacing event.

Cumulative Effects on Forest Health and Sustainability

As can be seen in Table 65, the East Face project area is severely deficit in OFSS in all PVGs and slightly below HRV in moist OFMS and SE. It is also below HRV in stand initiation (SI) in both moist and cold PVGs. The area is also well above HRV in all PVGs in understory reinitiation (2-5 times above the upper HRV ranges).

Table 65 – East Face Existing Stand Structure and HRV by PVG

PVG	Existing Acres	% of PVG	Historical Range %
Old Forest Multi Stratum (OFMS)			
moist upland	2,277	12%	15-20%
dry upland	929	10%	5-15%
cold upland	2,574	16%	10-25%
Old Forest Single Stratum (OFSS)			
moist upland	27	0%	10-20%

PVG	Existing Acres	% of PVG	Historical Range %
dry upland	257	3%	40-60%
cold upland	392	2%	5-20%
Understory Reinitiation (UR)			
moist upland	11,275	59%	10-20%
dry upland	4,515	51%	5-10%
cold upland	7,175	45%	10-25%
Stem Exclusion (SE)			
moist upland	3,498	18%	20-30%
dry upland	1,795	20%	10-20%
cold upland	2,466	15%	10-30%
Stand Initiation (SI)			
moist upland	1,928	10%	20-30%
dry upland	1,412	16%	15-25%
cold upland	2,893	18%	20-45%

Treatments proposed in the East Face action alternatives restore some OFMS to OFSS stand structure (refer to analysis in the Wildlife Effects Analysis) and accelerates UR toward OF structure (5,464 acres in Alternative 2; 5,464 acres in Alternative 3; 6,860 acres in Alternative 4; and 7,713 acres in Alternative 5). Alternatives 2, 4, and 5 also convert some UR (89-328 acres) stands to SI which is below HRV, while Alternative 3 does not create any SI due to the use of intermediate harvests only. These changes in stand structure in combination with the thinning being accomplished in the Elkhorn Wildlife Area, the Limber Jim/Muir area, and the Ladd Canyon/RMEF area will contribute not only to landscape health and sustainability but also accelerate stands toward HRVs for all stand structures at the landscape level.

Prescribed fire within all of these project areas including East Face will reduce the number of suppressed seedlings competing for site resources at the landscape level and improve stand health and sustainability.

Thinning and fuel reduction activities on adjacent private lands would contribute to improving landscape resiliency and vegetative health reducing the potential susceptibility to insect and disease epidemics that can begin on any ownership and spread to adjacent ownerships.

Forest Plan Compliance

Alternatives 2-5 comply with the goals for timber in the 1990 Wallowa-Whitman National Forest (WWNF) forest plan as amended by providing for production of wood fiber to satisfy National needs and benefit local economies consistent with multiple resource objectives, environmental constraints, and economic efficiency. Opportunities for fuelwood gathering for personal and commercial uses would be available within the project area. These alternatives meet the forest plan standards and guidelines for timber because prescriptions have been prepared and reviewed by a certified silviculturist, meet the silvicultural needs of the stands being treated including stand structure and species composition, limit created opening sizes, utilize the appropriate yarding system for stand and ground conditions, and call for precommercial thinning of young stands to accelerate their growth. All action alternatives also propose to harvest timber only on lands suitable for timber management.

Wilderness, IRAs, and Undeveloped Areas

Introduction

During public involvement for the East Face Vegetation Management Project, a commenter identified an "Uninventoried roadless area of ecological significance" within the project area of almost 5,000 acres in size.

From the mid-1970s through 2001 the Forest Service maintained a roadless area inventory of undeveloped lands that we used and updated for RARE, RARE II, and in support of Land and Resource Management Planning completed in 1990. During that time, these lands were called "roadless areas" or "inventoried roadless areas" (IRA). With completion of the Roadless Area Conservation Rule (RACR) in 2001, these lands ceased being an "inventory", and IRAs became a designation with fixed boundaries and prohibitions set by that rule and Forest Service regulation (36 CFR 294).

The 2006 handbook for wilderness evaluation (FSH 1909.12 Chapter 70) is reflected in the 2008 Forest Service NEPA regulations (36 CFR 220). In the regulations, potential effects to "inventoried roadless areas" and "potential wilderness areas" are factors in determining what the appropriate NEPA document would be for a project.

The 2012 planning rule for land management planning for the National Forest System was published in the Federal Register on April 9, 2012, and it became effective 30 days following the publication date on May 9, 2012. The Forest Service released proposed planning directives for public review and comment on February, 2013. Over 16,000 comments representing diverse communities and interests from across the country shaped the final planning directives. The final planning directives were released and became effective January 30, 2015. The planning rule is very clear that application of the criteria for inventory of areas that may be suitable for inclusion in the National Wilderness Preservation system (FSH 1909.12, Chapter 70) is at the land management planning (Forest Plan) level only. The Blue Mountain Forest Plan Revision DEIS 2014 (BMFPR) completed an inventory identifying a set of PWAs across the Blue Mountains. The PWAs identified in the BMFPR DEIS will be considered in this analysis.

The term "other undeveloped lands" is presented and used in this document to provide a consideration for the unroaded areas identified during public scoping efforts.

Existing Condition

Wilderness and Inventoried Roadless Areas

The USDA Forest Service, Pacific Northwest Region (PNW or Region 6) covers approximately 27.2 million acres within the states of Oregon and Washington. These acres represent approximately 27% of the total acreage of both states combined. These 27.2 million acres are managed based on the land allocations designated within the respective National Forest Land and Resource Management Plans. However, the management of designated Wilderness areas and the management of Inventoried Roadless Areas are overriding and common among all Forests within the Pacific Northwest Region and across the nation. In Region 6, there are approximately 4 million acres of Inventoried Roadless Areas (15% of the total National Forest System Lands) and approximately 5 million acres of Wilderness (18%).

The southernmost tip of the East Face Vegetation Management Project area borders approximately ½ mile of the North Fork John Day Wilderness. It also borders the Twin Mountain Inventoried Roadless Area (IRA) along the southern boundary on the other side of the Elkhorn Scenic Byway (Forest Road 73), the Upper Grande Ronde IRA on the western side of the project boundary on the other side of Forest road 43, and a portion of the Beaver Creek IRA along the northwest edge of the project area (Figure 1).

Potential Wilderness Areas

The BMFPR completed an extensive analysis of lands that could be considered potential wilderness areas (PWAs). PWAs were identified in conjunction with the Beaver Creek, Upper Grande Ronde, and Twin Mountain IRAs as well as the North Fork Wilderness Area; however, none of these are located within the East Face project area boundary (Figure 1). All of them are on the other side of the major roads (National Forest roads 73 and 43) bounding the East Face project area.

There are no lands inventoried for wilderness character located on the BLM lands within the project area.

Other Undeveloped Lands

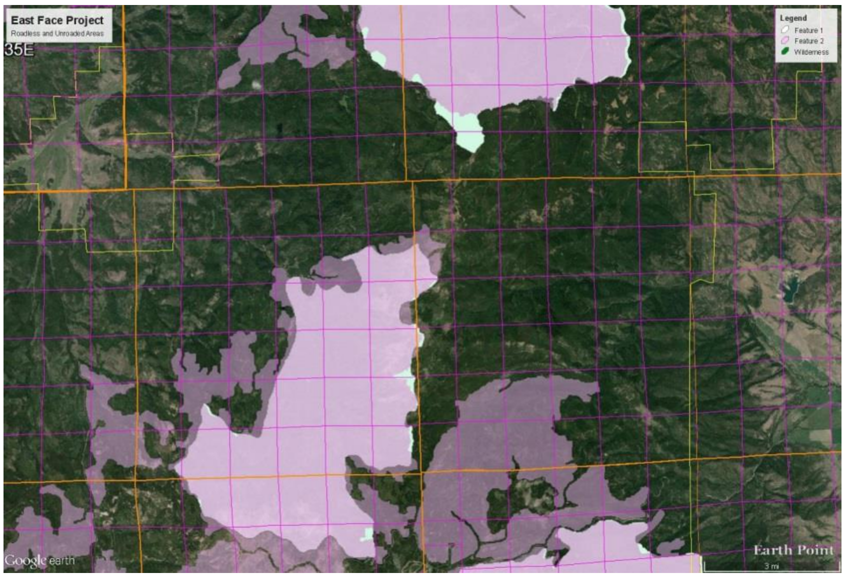


Figure 6 – Oregon Wild Roadless Area Map.

Oregon Wild provided the map shown in Figure 6 during scoping and urged that two units from the proposed action (104 and 105) and their associated temporary roads be dropped from treatment consideration because they "appear to be located in the ecologically significant Bear Butte unroaded area that is almost 5,000 acres in size" (they have defined Feature 1 and Feature 2 as roadless areas). No further description of these areas or information related to the attributes that made them ecologically significant was provided by Oregon Wild. All of this area is located outside of the BMFPR PWAs.

This undeveloped area is allocated in the Wallowa-Whitman Forest Plan to:

MA16 – Administrative Sites (i.e. Anthony Lakes Recreation Area)
MA6 – Backcountry
MA15 – Allocated Old Growth
MA1 – Timber Production Emphasis

Nearly one half of the area is allocated to MA1 with the remainder primarily allocated to MA6 and two large blocks of allocated old growth. The MA16 encompasses the Floodwater Flats residences and Mud Lake area within the Anthony Lakes WUI.

Vegetation - The 1960 Anthony Creek fire and the 1990 Bear fire burned through approximately one quarter to one third of the undeveloped area identified in Figure 2 within the East Face project area. These areas have regenerated as lodgepole thickets with interspersed patches of large pine and larch which survived these earlier fires. Most of the area is predominantly lodgepole pine with some small scattered moist forest patches throughout the area. Within the northwest corner of the undeveloped area between Anthony Creek and road 4380 are some areas of old forest multi-stratum old growth (OFMS). There are no threatened and endangered plant species located within this area; however, there is a population of whitebark pine (candidate species for listing as threatened) located within the southwest corner of this undeveloped area.

Fisheries and Water - Anthony Creek, a class I stream runs along the northern edge of this area and south to Mud Lake (within the identified area) and on to Anthony Lake (outside of the area) contributing heavily to the swampy/boggy nature of the southwest end of the identified undeveloped area. Five miles of Anthony Creek, a perennial fishbearing stream, is designated as spawning and rearing habitat and designated critical habitat for bull trout, listed as threatened; however, two irrigation diversions (Carnes and Couganhour) prevent fish passage into the identified undeveloped area. Recent bull trout and brook trout surveys confirm that only brook trout are in the stream reach within this undeveloped area and no bull trout were found.

Soils - Soils within this identified area are primarily volcanic ash over decomposed granitics (Landtype associations 131, 132, and 156). They are highly erosive resulting in areas with gully/rill erosion and lost surface vegetation on steep slopes. Refer to the soils analysis for more information on these soil types.

Threatened & Endangered Wildlife - There are no threatened or endangered wildlife species within this undeveloped area. Thirteen species listed as sensitive either have potential habitat within the project area or have been documented to occur in the project area. Proposed project activities would either have a beneficial impact on these species or may impact individuals or their habitat but would not cause a trend toward listing of the species.

Opportunities for Solitude - The southwest corner of this undeveloped area is immediately adjacent to and encompasses a portion of (in the Mud Lake area) a very developed year round recreation area which receives extensive use by recreationists. Due to the presence of the Anthony Lakes Recreation Area, the Floodwater Flats recreation residence tract, and Mud Lake campground this portion of the undeveloped area does not provide for optimum opportunities for solitude. The same is true of the northeast portion of this area as it is surrounded on 3 sides by not only several major roads (roads 7312 and 4380) but also a network of previously closed roads which still receive motor vehicle use, especially during big game hunting seasons which run from August to November. The area with the greatest opportunity for solitude would be toward the center of the undeveloped area around Anthony Creek. Topography in this area is very steep with deep incised canyons. From the top of some of these ridges views into the valley and of Pilcher Creek Reservoir can be seen. There are no trails into these areas and access can be difficult due to the topography and the dense thickets of lodgepole pine.

Apparent Naturalness – As described above, in the southwest corner of this area the imprint of man's work is fairly obvious not only in the foreground but also of the ski area in the background. The central portion of the undeveloped area has higher levels of apparent naturalness with areas of exposed rock formations. While the vegetation is not particularly unique or remarkable it has been primarily affected by the forces of nature such as fire and erosion. The northeastern corner of this area still has obvious old dozer lines put in during fire suppression activities and some very old skid trails/logging roads from harvest units back in the early 1970's or possibly older. This area does not have the same level of apparent naturalness found in the central portion of this area.

Effects

Scale of Analysis

The scale of this analysis includes all acres (Forest Service and BLM) contained within the East Face Vegetation Management project area (47,636 acres) and adjacent Forest Service and other federal lands, as appropriate, sufficient to consider adjacent roadless, wilderness, and potential wilderness areas (identified in the BMFPR effort). The analysis area is approximately 110,666 acres (Figure 7).

The measures used to compare between alternatives for lands with wilderness characteristics are:

- Intrinsic biophysical values (soils, water, fisheries, plants, wildlife)
- Intrinsic social values (recreation, apparent naturalness, remoteness, scenic quality, cultural resources)
- Other locally identified unique characteristics

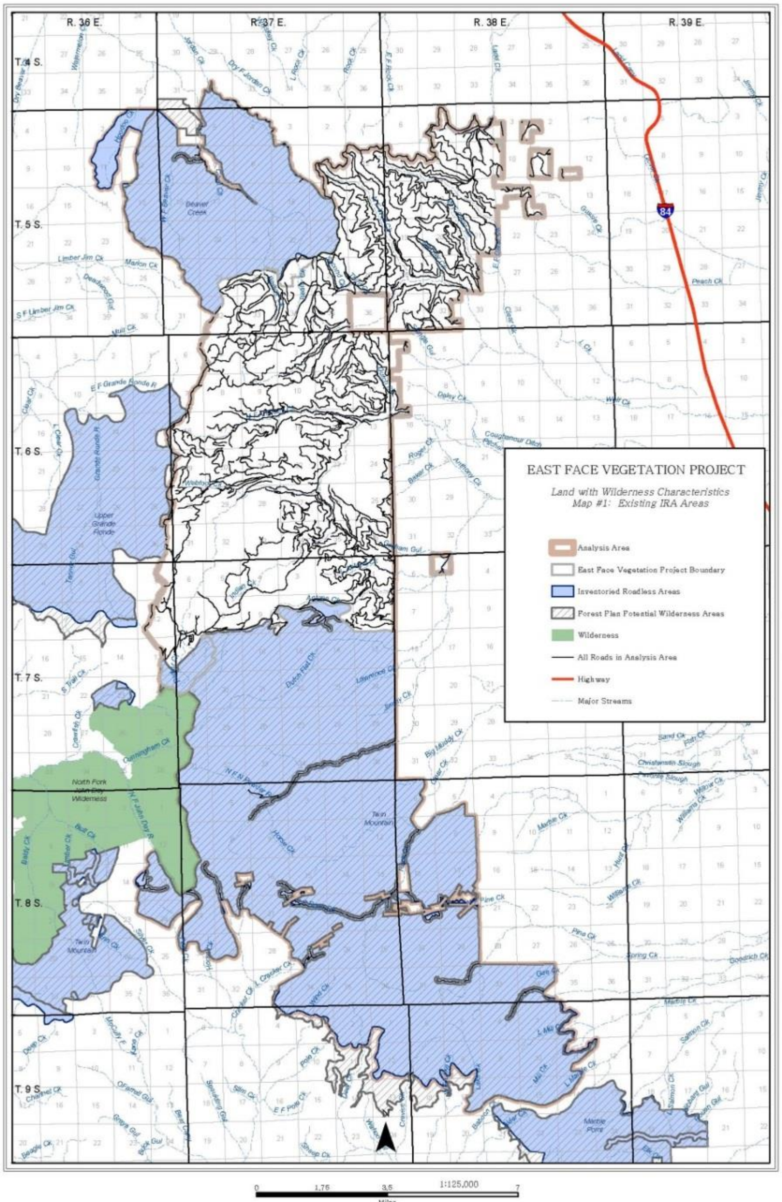


Figure 7 – East Face Wilderness, IRA, Undeveloped Lands Analysis Area

No Direct/Indirect or Cumulative Effects

Wilderness and Inventoried Roadless Areas

No project activities are proposed in the Wilderness or any of the IRAs. The proposed project would have no direct, indirect or cumulative effects on designated Wilderness areas or IRAs; therefore there will be no further discussion on designated wilderness or inventoried roadless areas in this report.

Potential Wilderness Areas

As described above, all of the BMFPR PWAs are on the other side of the major roads (National Forest roads 73 and 43) bounding the East Face project area. Therefore, the proposed project will have no direct, indirect or cumulative effects on any BMFPR PWAs and there will be no further discussion on these areas in this report.

Direct and Indirect Effects on Undeveloped Lands

Other Undeveloped Lands

ALTERNATIVE 1

The entire undeveloped area would remain as described in the existing condition section above under this alternative. There would be no direct or indirect effects on this area other than it would not receive the whitebark pine enhancement work planned within the fuel reduction units in the southwestern corner.

ACTION ALTERNATIVES

Table 66 describes proposed treatment units within the identified undeveloped area. All action alternatives treat units 311-313; a portion of each is located within the undeveloped area.

Table 66 – Summary of Treatment Units within Undeveloped Area

Unit	Total Acres	Acres w/in Undeveloped Area	Treatment Type	Notes	Alternatives Treated In
310	351	40	WFH	This area located along the ridgetop near Bear Butte and immediately adjacent to 7300144 road. Area has been harvested in the past. Fuel reduction is all by hand.	2, 4, 5
311	316	245	WFH	This unit is surrounded on 3 sides by the Floodwater Flats road 7300160, Elkhorn Scenic Byway (Forest Rd 73), and the 7300142 road. Area is steep and also has the OTEC powerline in it. Located within the Anthony Lakes WUI. Fuel reduction is all by hand.	2, 3, 4, 5
312	424	200	WFH	Unit is surrounded on 2 sides by the Elkhorn Scenic Byway (Forest Rd 73) with the Floodwater Flats road 7300160 along the eastern edge. Also has the Mud Lake Campground in the southern part of the unit. A couple trails appear to also be within this area. Located within the Anthony Lakes WUI. Fuel reduction is all by hand.	2, 3, 4, 5
313	164	40	WFM	Most of this unit is on the west side of the 43 road treating areas adjacent to the Grande Ronde Lake campground. The 40 acre portion within the identified undeveloped area is adjacent to the 43 road on the east side where the 4300940 road takes off. Fuel reduction within this unit is accomplished using a slashbuster.	2, 3, 4, 5
104	26	0	HTH	This unit is located outside of the identified undeveloped area.	2, 5
105	18	18	HTH	This unit is adjacent to Anthony Creek and within 800-1200 feet of road 7312650.	2, 5

Vegetation

As described under the Forest Health and Sustainability effects, fuel reduction treatments will improve the health, vigor and sustainability of stands by not only thinning lodgepole thickets and reducing their susceptibility to insects and diseases but also create some heterogeneity in a very homogeneous landscape. The OFMS stands within this area are not treated under any of the alternatives. Due to riparian buffers and avoidance mitigation measures incorporated into project design no sensitive plant species are impacted within this undeveloped area. All of these alternatives provide for enhancement of whitebark pine trees located within the southwest corner of this undeveloped area.

Fisheries and Water

None of the alternatives propose treatments within the riparian area of Anthony Creek. The treatments within the swampy/boggy are of the southwest end of the identified undeveloped area will be only treated by hand which will not negatively impact this area.

Soils

The soils effects analysis shows that units 310-312 will not affect detrimental soil conditions due to the gentle slopes and the use of hand treatments. Unit 313 has the potential to slightly increase detrimental soil conditions but it is 16% below Forest Plan standards. Units 104 and 105 have a moderate erosion hazard potential; however, due to gentle slopes within the units the detrimental soil conditions are estimated to be well below Forest Plan standards under Alternatives 2 and 5. Because 104 is not located within the undeveloped area defined above it would have no effect on the soils within that area.

Threatened & Endangered Wildlife

The treatments proposed in this undeveloped area are not expected to impact sensitive wildlife species due to their location, implementation of riparian buffers, and nature of the treatments under all action alternatives.

Opportunities for Solitude

As described under the existing condition discussion above, the southwest corner of this undeveloped area is influenced by the developed year round recreation opportunities surrounding it, resulting in limited opportunities for solitude within the area. Fuel reduction treatments under all action alternatives within this area are minor in nature and would not change the limited opportunities for solitude already available within this area. The same is true of treatment of unit 105 in Alternatives 2 and 5 in the northeast part of the described undeveloped area. There are limited opportunities for solitude within this area currently and treatment of unit 105 would not change these limited opportunities.

The area with the greatest opportunity for solitude (area within the center of the undeveloped area around Anthony Creek) would not be affected by any activities proposed under any of the action alternatives as no activities are proposed within this area.

Apparent Naturalness

While treatments in the southwest corner of this area would reduce the apparent naturalness within the area for the short term (3-5 years) the impacts are expected to be minor due to scenery mitigations such as screens, low stumps, slash pile location requirements, etc. Because the imprint of man’s work is already quite obvious within much of this area, the action alternatives would have a very minor impact within this area. The central portion of the undeveloped area with the highest levels of apparent naturalness would not be affected by any of the action alternatives as no treatment is proposed within this area. Treatment of unit 105 under Alternatives 2 and 5 would also reduce the apparent naturalness within this area by leaving obvious signs of active stand management such as stumps and slash piles; however, this area already has signs of active management in the past. Alternatives 3 and 4 would retain current levels of apparent naturalness within these areas.

Cumulative Effects on Undeveloped Lands

Other Undeveloped Lands

ALTERNATIVE 1

Under this alternative no actions would be authorized; therefore, it would not add anything to the effects of past, present, or reasonably foreseeable future actions. Based on the definition provided by the CEQ regulations, there would be no cumulative effects for this alternative.

ACTION ALTERNATIVES

The OTEC Powerline fuel reduction/clearing work beneath and adjacent to the powerline corridor has the potential to impact apparent naturalness in the southwest portion of the undeveloped area defined in this project area. Powerline clearing, in combination with the adjacent fuel reduction treatment in East Face unit 311, would create some additional impacts to apparent naturalness in this area creating a substantially noticeable human imprint.

Forest Plan Consistency

With the exception of the fuel reduction work done in MA6 which is part of the Forest Plan amendment, activities proposed in the East Face project area are consistent with the intent of the land allocation decisions made in the Forest Plan including wilderness and inventoried roadless areas.

Wildlife – Big Game

Introduction

Rocky Mountain elk have been selected as an indicator of habitat diversity, interspersion of cover and forage area, and security habitat provided by areas of low human disturbance. Elk management on the Wallowa-Whitman National Forest is a cooperative effort between the Forest Service and the Oregon Department of Fish and Wildlife (ODFW). The Forest Service manages habitat while ODFW manages populations by setting seasons, harvest limits, and goals for individual Wildlife Management Units (WMU). The East Face project lies within the Starkey WMU.

Potential elk habitat effectiveness may be evaluated using the Habitat Effectiveness Index (HEI; Thomas et al. 1988). This model considers the density of open roads, the availability of cover habitat, the distribution and juxtaposition of cover and forage across the landscape, and forage quantity and quality. More recently, Rowland et al. (2005) has proposed the use of distance band analysis (DBA) to better understand the effects of roads on elk security habitat.

Background Information

Rocky Mountain elk (*Cervus canadensis nelson*- hereafter elk) are an important big game species in northeastern Oregon (Csuti et al. 2001) and are an indicator of the quality and diversity of forested habitat (defined as $\geq$ 40% canopy closure, USDA LRMP 1990) which includes an interspersion of cover and forage areas, and security habitat provided by cover and low levels of human activity (Thomas 1979). It is commonly accepted that the other big game species (i.e. mule deer, white-tailed deer, black bear, and cougar) are at least partially accommodated when high quality elk habitat is present. Elk are habitat generalists; they exploit a variety of habitat types in all successional stages and their patterns of use change daily and seasonally (Toweill and Thomas 2002). Optimal calving habitat is gentle terrain with plenty of succulent vegetation less than 1,000 feet from water, with an abundance of low shrubs or small trees under an overstory with a ≥ 50% canopy closure (Thomas 1979). Elk are quite responsive to land management activities, thus the density or health of elk populations (as opposed to examining population trends) most likely indicate the effectiveness of elk management. (Toweill and Thomas 2002).

Logging generally results in increased elk forage, with declines in the short term (1-3 years), followed by large increases in forage that may last 10 years or longer (Wisdom et al. 2005b). Large-scale habitat manipulations are being conducted with increased frequency in western forests, and although fuels reduction via thinning or prescribed burning often is assumed to benefit wildlife (Toweill and Thomas 2002, Wisdom et al. 2005a), based on the interacting effects of fuels reduction and season on forage characteristics, Long et al. (2008) suggests that maintaining a “mosaic of burned and unburned forest habitat may provide better long-term foraging opportunities for elk than burning a large proportion of the stand on a landscape.”

Displacement of elk from areas during human activities (e.g. logging, fuels reduction) is well documented (Edge 1982, Toweill and Thomas 2002, Wisdom et al. 2005a). Under most cases, this displacement is temporary, and there is no evidence that elk will not eventually return to harvested areas (Toweill and Thomas 2002). Of much more concern to resource managers are the establishment of roads associated with harvest activities that increase accessibility to recreationists (e.g. hunter, hikers, cross country skiers, OHV). Increased road use by recreationists has been shown to significantly reduce elk security (Towill and Thomas 2002), increase stress levels (Creel et al. 2002), and increase elk vulnerability to mortality from both legal and illegal hunter harvest (Rowland et al. 2005).

Blue Mountain/WWNF Population Viability

The National Forest Management Act (1976) requires that habitat exist to provide for viable populations of all native and desires non-native vertebrates. Elk is a game species that is managed on a management objective (M.O.) basis. Management objectives were developed to consider not only the carrying capacity of the lands, but also the elk population size that would provide for all huntable surplus, and tolerance levels of ranchers, farmers, and other interests that may sometimes compete with elk for forage and space. Biologically, a population that is managed around a M.O. is much larger than a minimum viable population. A minimal viable population represents the smallest population size that can persist over the long term. Historically there were game species, including elk, which warranted serious conservation concerns due to depressed populations and range contractions resulting from unregulated market and sport hunting and loss of habitat. Many of the factors that contributed to the decline of large wild ungulates in the past do not exist today. Currently, elk populations on the WWNF are regulated by hunting and predation. Elk numbers are substantially higher than what would constitute a concern over species viability.

Existing Condition

The East Face project area falls within the Starkey WMU (ODFW) contained within the Umatilla-Whitman Province. Elk populations in the province increased from about 7,500 in the late 1960’s to about 19,000 in the mid-1970’s. Populations have remained between 15,000 and 20,000 ever since. The Starkey unit has remained fairly stable over the years. In 2001, elk numbers were about 116% of the management objective of 17,100.

The Forest Plan establishes standards for wildlife habitat, and more specifically elk habitat on the Forest. The East Face analysis area provides year round habitat for big game, though winter range and summer range are minimal; 996 acres of MA-3 (wildlife/timber emphasis- big game winter range) lies along the eastern/center edge of the analysis area. 35,051 acres is designated MA-1 (Intensive timber management) and covers the majority of the project area. 3,687 acres is designated MA-3A (wildlife/timber emphasis- big game summer range) and lies along the eastern portion of the analysis area. High security habitat is provided within the north eastern and south eastern/central portions of the analysis area due to limited motorized access and seasonal closures.

The East Face project area was analyzed using a habitat effectiveness model (Thomas et al. 1988) to assess the quality of elk habitat. The HEI model evaluates size and spacing of cover and forage areas, density of open roads, quantity and quality of forage available to elk and cover quality. Forage data is unavailable and is not included in the total HEI value. To further examine security habitat for elk, a distance band analysis (DBA) was performed as described by Rowland et al. (2005), and a separate HEI value was calculated (Table 67). DBA calculates the percent of the analysis area from varying distances from open motorized routes. HEI was analyzed at the project level, which is approximately 47,600 acres.

Cover: Forage Ratio – A cover: forage ratio is used to describe the relative amounts of cover to forage and while the optimal ratio of cover to forage is 40:60 (Thomas 1979), the LRMP establishes a minimum standard that at least 30% of forested land be maintained as cover (>40% canopy closure). “Forested land” refers to only those acres that currently provide forested cover or have the potential to provide it, not to grassland, shrub steppe, rock, or bodies of water. Cover refers to any combination of satisfactory cover (a stand of coniferous trees with >70% canopy closure) and marginal cover (a stand of coniferous trees with 40-70% canopy closure). Forage habitat has less than 40% canopy cover.

The existing cover: forage ratio is 71:29. This ratio exceeds the LRMP standard, suggesting a high surplus of cover, however stand data was collected in the early 80’s and the ratio may misrepresent the analysis area based on changed conditions due to natural disturbances over time.

Cover Quality – Forests stands with relatively closed canopies function as thermal and security cover, providing a visual barrier from predators, and may reduce the effects of ambient temperature, wind, and long and short wave radiation functions on energy expenditure (i.e. increased metabolic rates) in elk. Although the benefits to elk of “thermal cover”, in the true sense of the word, has been questioned (Cook et al. 1998, Bender and Cook 2005), the intent of the standard in managing elk habitat remains credible in that habitat attributes can be influential to energy balances by affecting forage quality and quantity, and mediating energy expenditures associated with travel and harassment (Bender and Cook 2005). By implementing the current “thermal cover” standard, resource managers are also providing needed barriers to minimize the negative effects of human disturbance.

The Wallowa-Whitman LRMP establishes a minimum standard for big game thermal cover (marginal and satisfactory combines). At least 30% of the forested lands should be maintained in a thermal cover condition. All Management Areas were pooled for analysis, because they have the same cover standard, thus providing for a more landscape-scale based approach. There are currently 5,685 acres (12.8%) of satisfactory cover, 26,689 acres (58%) of marginal cover and 13,282 acres (29%) of forage habitat within the analysis area resulting in a cover quality value of 0.59 (Table 67).

Size and Spacing – Thomas et al. (1979) suggest that size and spacing of cover and forage habitat is a key to elk use of forested habitat, and this assumption was verified by Leckenby (1984) in the Blue Mountains of northeastern Oregon. Size and spacing of habitat is considered optimal when cover to forage edge widths are between 100-200 yards (Thomas et al. 1988). Considering an HE value of 1 is optimal, an HE size and spacing value of 0.53 (Table 67) indicates that forage to cover ratios within the analysis area is less than optimal, but acceptable. However, this variable is not meant to stand alone and therefore management decisions for providing optimum elk habitat solely based on HE size and spacing value should be used with caution.

Open Roads – Excessive open road densities have deleterious effects on habitat effectiveness by taking land out of production (1 road mile equals 4 acres of land), reducing the effectiveness of cover and increasing disturbance to elk. The existing average open road density within the East Face analysis area is 1.74 mi/mi^2 (Table 67). 74% of the East Face planning area is designated MA-1 and the average open road density is lower than the forest plan guideline of 2.5mi/mi^2 for MA-1. However, the road density estimate does not take into account off-road vehicle use on OHV trails, cross-country travel and on closed roads. When these variables are taken into account, road density estimates are likely to be higher.

An important finding from the Starkey Experimental Forest and Range studies is that road (or route) density is not the best predictor of habitat effectiveness for elk. Instead, a method using distance bands proved to be a more useful tool for assessing effects from roads. Road densities do not provide a spatial depiction of how roads are distributed on the landscape (Rowland 2005), but a distance band analysis does. A distance band analysis uses GIS to draw concentric bands around motor vehicle routes until the entire area of interest (in this case the East Face analysis area) is occupied by these bands. The distance band closest to motor vehicle routes (within one half mile) provides the least security for elk. As a result, elk choose to spend less time within one half mile of motor vehicle routes. As distance from motor vehicle routes increases, so does habitat effectiveness for elk. Elk find more security from human disturbance further from motor vehicle routes. The second distance band occupies the area between on-half and one mile from motor vehicle routes, and represents moderate quality security habitat for elk. Effects from motor vehicles begin to dissipate within the second distance band. Finally, effects from roads are nearly negligible within the third distance band that occupies the area greater than one mile from motor vehicle routes. The third distance band represents high to optimal quality security habitat for elk. For this analysis, the percentage of the landscape within each distance band was used as a means of comparing alternatives with regard to the effects of motor vehicle disturbance to elk.

Habitat Effectiveness Index – The Habitat Effectiveness Index (HEI) values are based on a comprehensive elk habitat model developed by Thomas et al. (1988). These values consider the interaction of size and spacing of cover and forage areas, density of roads open to vehicular traffic, forage quantity and quality, and the quality of cover. For this report, HEI values were calculated without a forage quality value because accurate forage data is not available. Roads often compromise the effectiveness of cover. The Forest Plan establishes minimum standards for the overall index. In addition, the Forest Plan establishes minimum standards for retention of total cover and open road density. Excessive open road densities have deleterious effects on habitat effectiveness by reducing the quality of security cover and increasing disturbance. These negative impacts change elk distribution and behavior. The impacts of OHV's on closed roads and cross country travel are not considered in an HEI analysis, although they likely cause some further reduction in habitat effectiveness. The existing values are 0.58 (road density analysis) and 0.55 (distance band analysis; Table 67).

Table 67 - Habitat-effectiveness index calculations for elk habitat within the East Face analysis area

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE Cover	0.59	Amount of satisfactory cover relative to marginal cover
HE Size and Spacing	0.53	Mosaic of cover and forage, 64:36

Habitat Effectiveness Variable	Habitat Effectiveness Value (Optimal = 1.0)	Comments
HE r value using road density	0.51	Open road density 1.79 mi/mi sq LRMP MA-1 ≤ 2.5 mi/mi sq LRMP MA-3/3A ≤ 1.5 mi/mi sq
HE r value using distance bands	0.40	Concentric bands around open roads
Total HEI using road density[1]	0.58	LRMP MA-1 ≥ 0.5 HEI
Total HEI using distance band analysis*	0.55	LRMP MA-1 ≥ 0.5 HEI
Percent of area ≥0.90 mi from open motorized route*	3%	High quality security habitat

[1] HEI calculations do not include a forage variable because current, reliable forage data are not available
* Habitat ≤0.90 mi from an open motorized route is considered marginal or poor

Effects

Assumptions

The direct, indirect and cumulative effects analysis area for elk is the East Face project area. This area is over 192 km^2. The annual home range of an adult elk can be as much as 163 km and so the East Face project area is large enough to support a herd of elk.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on Old Growth resources.

- Roadside hazard tree removal
- Planting, Whipfelling, grapple piling
- Snag Retention
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to Rocky Mountain elk section.

Direct/Indirect Effects for Rocky Mountain Elk

ALTERNATIVE 1 (No action)

Under this alternative, the risk of uncharacteristic wildfire or disease/insect outbreak would continue to increase naturally over time because there would be no changes to stand stocking levels or fuel loading from active management. Assuming no uncharacteristic wildfires or disease/insect outbreaks, deer and elk would likely continue to benefit from dense stands and the landscape would continue to be deficient in forage. If uncharacteristic wildfire or disease/insect outbreaks occurred, the condition of habitat would likely decline due to loss of canopy cover and structural diversity, and then slowly improve over the long-term. The loss of overstory cover would represent a long-term reduction. Deer and elk would lose cover habitat, but would likely benefit from the trade-off of increased forage opportunities. The impact to habitat would depend on the size and severity of the disturbance.

Without disturbance, (e.g. wildfire, insect outbreak), the existing cover: forage ratio (71:29) would not be altered. Current levels of cover would remain and continue to influence elk distribution and movement within the analysis area. This no action alternative would forego opportunities to improve big game habitat including: 1) converting some cover to forage thus transitioning habitat to more closely reflect optimal ratios (40:60; Thomas 1979); and 2) Forage quality and quantity would not be enhanced through prescribed fire (Long et al. 2008). Decadent shrubs and grasses that have been absent of fire for several decades will continue to provide marginal quantities and quality of forage.

ALTERNATIVES 2-5

Cover-Forage

Table 68 displays the HEI model outputs for the East Face project area boundary. All action alternatives would affect elk habitat. Existing conditions show a surplus of marginal cover with forage being a limiting factor. All alternatives will reduce satisfactory and marginal cover (Table 68), but will retain or slightly improve HEI values by improving the forage to cover arrangement (Table 69). All action alternatives meet or exceed LRMP standards for percent cover and HEI. Forest stand tree density reductions from commercial treatments (thinning) with additional prescribed fire treatments would increase available elk forage. The HEI model uses ranges of canopy closure (CC) to identify forage (0-39% CC), marginal cover (40-69% CC), and satisfactory cover (>70% CC). Post-treatment tree densities are expected to be variable, consisting of denser patches interspersed with more open areas, but generally commercial thinning will convert marginal cover to forage. The amounts of forage, marginal and satisfactory cover remaining under each alternative does not reflect the finer scale mixture forage, hiding cover and small marginal cover patches that result from many intermediate commercial thinning prescriptions. Cook et al. (1996) identified forage quality on late summer and fall ranges as an important factor in elk fecundity and juvenile elk growth, and stresses the importance of evaluating forage quality for assessment of habitat quality of these seasonal ranges.

A coarse scale elk habitat selection model is currently under development by the Pacific Northwest Research Station (http://www.fs.fed.us/pnw/research/elk/bluemtns/index.shtml). This model uses a dietary digestible energy variable, vegetation classes, mean slope and distance to roads to estimate elk habitat selection (Low-High). This model was run using existing conditions to help identify areas of medium-high use that would benefit from an increase in forage, particularly in summer range. 3,686 acres of summer range exist on the middle - western edge of the project boundary and has been identified as an area that will benefit from forage creation and enhancement. This tool is currently not sensitive enough to identify differences between project alternatives (personal communication, PNW research lab). Alternatives 2, 3, and 5 would create forage within the summer range described above, with Alternatives 2 and 5 creating the most (823 acres) and Alternative 3 creating 544 acres. Alternative 4 would not create any forage within summer range as treatments were either deferred or converted to non-commercial which would not convert cover to forage. Although cover will be converted to forage in all management areas, a high degree of interspersion of forage and cover stands would remain to meet the LRMP direction for cover in MA3 and MA3A.

Table 68 - Summary of Cover Conversions by Action Alternatives (acres)

Indicators	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Satisfactory converted to marginal cover	0	289	93	279	289
Satisfactory cover converted to forage	0	0	0	0	0
Marginal cover converted to forage	0	3,024	2,208	2,618	3,024

Indicators	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Cover converted to forage in MA3A	0	823	544	0	823
Cover converted to forage in MA3	0	157	75	122	157

Table 69 - HEI Variables by Alternative

Alternatives	HE_Cover	HE_Spacing	HE_Road Density	HE_Distance Band	HEI_Road Density	HEI_Distance Bands	Cover/ Forage Ratio	% Cover	% Satisfactory Cover	% Marginal Cover
1	0.59	0.53	0.51	0.39	**0.58**	**0.55**	71:29	71%	12.8%	58.2%
2	0.59	0.61	0.51	0.39	**0.6**	**0.57**	60:40	60%	10.5%	49.9%
3	0.59	0.58	0.51	0.39	**0.59**	**0.57**	65:35	65%	11.4%	53.5%
4	0.59	0.61	0.51	0.39	**0.6**	**0.57**	60:40	60%	10.5%	49.9%
5	0.59	0.61	0.51	0.39	**0.6**	**0.57**	60:40	60%	10.5%	49.9%

Roads

The HEI model developed by Thomas et al. 1998 relies on open road density as an indicator of relative effects from roads on elk habitat. Management areas were pooled because MA3/3A acres only represent 10% of the project area and are not large enough to analyze on their own. Road densities within the project area do not change with the alternatives and stay at marginal levels (0.51) though the actual density (1.74 mi/mi^2) is below Forest Plan recommended levels of 2.5 mi/mi^2 for MA1.

More recent research in northeastern Oregon found that road density is a poor indicator of habitat effectiveness (Rowland et al. 2000). By contrast, the study described a strong linear increase in elk use as distance from roads increased. Therefore, a method using a distance banding approach, as described by Rowland et al. (2005), is utilized here as an alternate indicator of road effects on elk habitat in the East Face project area. Table 69 shows habitat effectiveness values for roads using distance banding (HE_Distance_Band). Results indicate lower HE_{road} values when using distance banding as compared to using road densities (0.39 vs. 0.51). These lower HE_{road} values equate to lower overall HEI values, which is likely a more accurate portrayal of HEI than when calculated using road densities. However, HEI still remains above Forest Plan recommended levels and action alternatives do not change HEI_{road} values.

Currently there are two areas with seasonal closure restrictions within the East Face project area; Indian Creek-Gorham Butte and Clear Creek. These areas are closed from October 26th to Nov 16th for the bull elk rifle season. This restriction was put in place over 20 years ago in response to heavy hunter traffic during the rifle season. However, over the years the heaviest use period has changed from rifle season to archery season and the travel restrictions are no longer performing their function. Alternative 5 proposes increasing the closure period to include all of the big game hunting seasons, providing disturbance relief for the elk and a better hunting experience for hunters. Alternatives 2, 3, and 4 would not provide these improvements for elk or hunters.

Cumulative Effects for Rocky Mountain Elk

Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF lands have been incorporated into the existing condition. The current condition of elk habitat is largely a function of past management activities and historic large wildfires. Historically, the area was unroaded, and forest stands were less dense and provided larger amounts of forage.

Cattle grazing will continue within the project area. The majority of range acres in the project area are grazed from June 1 – October 30. Resource partitioning between elk and cattle in northeastern Oregon was studied by Stewart et al. (2002). Elk utilized steeper slopes and higher elevations than cattle when cattle were present, possibly indicating competitive displacement of elk by cattle. Diet overlap between cattle and elk has been described, and is most prominent when forage resources are limited. However, most of the rangeland on NFS lands contained within the analysis area is in satisfactory condition.

The cooperative closure areas would seasonally offset disturbance within the project area by increasing big game security habitat and escapement during some hunting seasons under Alternatives 2-4 and increasing that period of time to all hunting seasons under Alternative 5.

Firewood cutting within this area may increase into additional areas due to the clearing and re-opening roads that have grown closed providing for increased disturbance from noise, vehicles, and people reducing security habitat during firewood season. More of this would occur under Alternatives 5 and 2 with the least number of miles re-opened under Alternatives 3 and 4.

Clearing and re-opening roads that have grown closed could also increase OHV access into the area which would also increase disturbance from noise and vehicles reducing security habitat. The Forest Travel Management Plan is expected to be in place within the foreseeable future. This plan would increase security habitat reducing levels of human intrusion by managing cross-country motor vehicle use and restricting use to designated roads, trails, and areas. This has the potential decrease disturbance and stress and increase habitat security having a positive effect on elk distribution and escapement during hunting seasons.

Conclusion

All action alternatives are consistent with LRMP standards and guidelines pertaining to elk. Treatments proposed under all action alternatives are expected to maintain or slightly improve elk habitat effectiveness, as indicated by HEI values, mostly due to an increase in forage availability. Proposed road openings and closures make small immeasurable changes to road density or HEI_{road} values. Increasing the seasonal closures on Indian Creek-Gorham Butte and Clear Creek closure areas as proposed in Alternative 5 would enhance elk security habitat during a time of increased disturbance and would have a positive effect on elk distribution and escapement. All action Alternatives would increase forage, but Alternatives 2 and 5 would have the greatest positive effect on forage availability in summer habitat.

Water Quality and Fisheries

Introduction

This report analyzes the effects on fisheries and watershed resources for the East Face Vegetation Management Project Area (herein referred to as East Face). Water quality and fisheries existing conditions are described in Appendix G of this EA and in the Fisheries and Watershed Existing Condition report on the web at: http://www.fs.usda.gov/project/?project=41765 .

The description of watershed/fisheries resources, along with the analysis of the expected and potential effects for each alternative were assessed using field surveys, water quality databases, supporting literature, and professional judgment.

Several management directives/recommendations apply to this project. The Management directives from the Wallowa-Whitman Land and Resource Management Plan (LRMP) 1990, the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH 1995); the Interim Strategies for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana and Portions of Nevada Inland Native Fish Strategy (INFISH); and the LRMP Biological Opinion (1998) will be followed. In addition, the PACFISH and INFISH amendments add further interim management direction in the form of Riparian Management Objectives (RMOs), Riparian Habitat Conservation Areas (RHCAs), and standards and guidelines.

The watershed resources section analyzes the direct, indirect, and cumulative effects to:

A. Water Quality
B. Fisheries Species and Habitat
C. Aquatic Management Indicator Species (MIS)

Assumptions

The project area is the analysis area for consideration of the direct and indirect effects of implementation of East Face project activities for all watershed resources. The entirety of all of the subwatersheds containing any part of the East Face project area will be the analysis area for cumulative effects for all watershed resources.

Direct effects to water resources are primarily related to sediment input from project actions which occur at the same time and place as watershed resources. Indirect effects are primarily related to sediment and stream temperature impacts which are caused by the action and are later in time or farther removed in distance. Cumulative effects are from present and reasonably foreseeable future actions that overlap in time and space with the effects of the East Face project.

Sediment Delivery Rates - The definition of accelerated sediment delivery for the East Face Project includes any increase over and above the natural sediment rates of the watershed.

INFISH RHCAs have been delineated on all streams within the East Face Project area. The effects analysis is based on the implementation of these RHCA buffer widths and those non-commercial buffer widths as described under the Alternative Description section of this EA.

It is difficult to equate soil erosion directly to sedimentation rates. Obstructions in the path (i.e. downed wood, grass/forb cover) between the sediment source and the stream reduce the risk of indirect sediment delivery to the stream. Therefore, adequate filter strips (in terms of size, ground cover and downed material) are necessary to slow or prevent sediment movement downslope of disturbed areas. The use of the riparian buffers described above has long been recognized as a mitigation measure to reduce sediment transport to streams. The structural complexity of roots and herbaceous vegetation, in addition to the absorption capability of the duff layer, limits excess sedimentation to the aquatic system. Surface runoff slows down when it comes in contact with herbaceous shrubs, mature trees and the duff layer on the forest floor and sediment is deposited within the riparian buffer before it reaches the watercourse (Decker 2003).

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face Project have been analyzed and are of such limited context and constrained nature that they would have little to no measurable effect on watershed and fisheries resources. These activities and their effects will not be discussed further in this effects analysis.

- Roadside Danger Tree Removal
- Whitebark Pine Treatments

Roadside danger tree removal will only occur outside of RHCAs. Danger trees felled within RHCAs will be left on site. No ground disturbance will occur within RHCAs from this activity, and there will be no potential effects to water quality or fisheries resources.

A. Water Quality

Direct Effects to Water Quality

ALTERNATIVE 1 - NO ACTION

There are no direct effects on water quality as a result of the No Action Alternative. Effects related to this alternative on water quality and stream temperature are primarily indirect in nature and are discussed in the Indirect Effects to Water Quality section.

ALTERNATIVE 2, 3, 4 and 5

The project activities that would have potential of direct effects on water quality are opening closed roads where culvert installation or cleaning of plugged culverts would occur, construction of new temporary roads where culvert installation and removal would occur, instream work associated with the replacement of the culvert on Wolf Creek for fish passage enhancement, and handwork within RHCAs.

Commercial Harvest

All mechanical treatments and commercial removal will occur outside of RHCA buffers and which would prevent direct effects to water quality.

Table 70 - Total Harvest Acres and proposed Logging System Acres

Logging and Systems	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Harvest Treatment Acres-Total	6,722	3,879	2,844	10,221
Skyline yarding	5295	416	419	1,450
Ground based equipment	1,094	3,239	2,092	8,350
Helicopter	333	224	333	421

Total proposed harvest treatment acres and proposed logging systems for Alternatives 2-5 are displayed in Table 70. For Commercial Harvest (HFU, HIM, HPO, HPO, HPR, HSA, HSH, HTH, WFH-BIO, and PCT-BIO units) RHCA buffers will be implemented as no activity stream buffers. RHCA buffer widths would prevent direct effects to water quality from commercial harvest. In skyline units, full suspension over the RHCA is required and will prevent direct effects to water quality. No direct effects to water quality from commercial harvest activities are anticipated in any action alternatives.

Fire Fuels Treatment (FFU)

Only Alternative 4 proposes 90 acres of fuels reduction (FFU units) outside of RHCAs in units 46, 66 and 147. Table 71 below displays the total acres of FFU treatment by subwatershed proposed under Alternative 4. FFU treatments using heavy equipment would occur outside of RHCA buffers only.

Table 71 – Alternative 4 Acres of Fire Fuels Treatment by Subwatershed

Subwatershed	Alternative 4 Acres
Lower Anthony Creek	3
Upper Beaver Creek	29
Upper Wolf Creek	58
TOTAL	**90 Acres**

Fuels reduction outside of RHCAs includes mechanical treatment using a slash buster (mastication) and piling slash with a grapple pile machine. For FFU units RHCA buffer widths would be implemented as minimum no activity stream buffers and would prevent direct effects to water quality from fuels reduction activities outside of RHCAs.

Precommercial Thinning (PCT)

Total acres of PCT treatment by alternative is displayed in Table 72. This includes all four types of PCT activities described on page 2 and the number of PCT acres that are within RHCA buffers.

The majority of proposed precommercial thinning acres will occur outside of RHCA buffers, however some acres of RHCA thinning is proposed in each alternative to improve conditions of riparian stands. See Table 72 for total acres of PCT treatment inside and outside of RHCA buffers by subwatershed.

Outside of RHCAs

Precommercial thinning outside of RHCAs in all action alternatives includes both handwork on slopes >30% and the use of slashbusters (mastication) on slopes <30%. This activity is outside of RHCAs, which will prevent direct effects to water quality in all action alternatives.

Within RHCAs

Alternatives 2 and 4 propose 238 acres of precommercial thinning (PCT units) within RHCAs. Alternative 3 proposes 225 acres of PCT within RHCAs; Alternative 5 proposes 45 acres of PCT within RHCAs. Thinning of overstocked trees < 9 inches dbh, and hand piling and burning of slash would occur in old harvest units within RHCAs. Trees would be thinned to a 14 by 16 foot variable spacing. For precommercial thinning by hand within RHCAs, minimum no activity stream buffers of 10 feet on Class IV streams (intermittent non-fish bearing), 30 feet on Class III streams (perennial non-fishbearing, and 50 feet on Class I streams (fishbearing) would be implemented. Depending on the amount of slash generated, hand piling and hand burning of slash piles within RHCAs outside of minimum no activity stream buffers may be required to address fuel accumulations.

Table 72 - Acres of Precommercial Thinning Inside and Outside of RHCAs by Alternative

Subwatershed/Treatment Type	Alt 2	Alt 3	Alt 4	Alt 5
Jimmy Creek				
PCT	74	74	74	74
PCT RHCA	0	0	0	0
Lower Anthony Creek				
PCT	824	824	1,384	824
PCT RHCA	65	65	65	0
Middle North Powder River				
PCT	297	297	376	297
PCT RHCA	16	16	16	0
Tanner Gulch Grande Ronde				
PCT	64	64	64	64

Subwatershed/Treatment Type	Alt 2	Alt 3	Alt 4	Alt 5
PCT RHCA	2	2	2	2
Upper Anthony Creek				
PCT	1,239	1,164	1,584	1240
PCT RHCA	123	110	123	20
Upper Beaver Creek				
PCT	<1	<1	1,244	<1
PCT RHCA	0	0	0	0
Upper Ladd Creek				
PCT	218	218	235	218
PCT RHCA	13	13	13	7
Upper Wolf Creek				
PCT	731	731	1,721	731
PCT RHCA	19	19	19	16
Totals				
Total PCT	**3,447**	**3,372**	**6,682**	**3,446**
Total PCT RHCA	**238**	**225**	**238**	**45**

No activity stream buffers would prevent direct effects to water quality because minimum no activity stream buffers would be implemented and no PCT treatments occur on streambanks or in stream channels with the implementation of Alternatives 2-5.

Fuels Hand Treatment (WFH)

Table 73 describes the acres of fuel reduction treatments proposed to occur within and outside of RHCAs in the East Face project alternatives. Within and outside of RHCAs WFH units would receive ladder and ground fuels reduction treatment involving precommercial thinning of live trees less than nine inches dbh to a spacing of 14 by 16 feet using chainsaws. Ladder fuels branches on trees up to six feet above ground would be pruned, and slash would be piled by hand and burned.

Outside RHCAs

Fuels reduction work by hand would be completed outside of RHCAs which will prevent direct effects to water quality under all action alternatives.

Within RHCAs

Fuels reduction work within RHCAs would be conducted by hand only (no mechanical treatment). For Fuels Reduction work within RHCAs, minimum no activity stream buffers of 10 feet on Class IV streams (intermittent non-fish bearing), 30 feet on Class III streams (perennial non-fishbearing), and 50 feet on Class I streams (fishbearing) would be implemented. Depending on the amount of slash generated, hand piling and hand burning of slash piles within RHCAs may be required to address fuel accumulations. Small diameter material created from fuels reduction would be hand piled and burned by hand, and would occur outside of no activity stream buffers. Burn piles within RHCAs would be approximately four feet in height and six feet in diameter. All piles would be spaced to avoid damaging or killing overstory trees during burning operations. Piles would be burned when there would be a high soil moisture content and would result in a low intensity burn to minimize effects to soils and vegetation.

No activity stream buffers would prevent direct effects to water quality since minimum no activity stream buffers would be implemented and no treatments occur on streambanks or in the stream channel. There would be no difference in the direct effects to water quality with the implementation of Alternatives 2-5.

Table 73 - Acres of Fuels Hand Treatment Inside and Outside of RHCAs by Alternative

Subwatershed/Treatment Type	Alt 2	Alt 3	Alt 4	Alt 5
Jordan Creek				
WFH	<1	<1	<1	<1
WFH RHCA	0	0	0	0
Lower Anthony Creek				
WFH	496	496	496	496
WFH RHCA	33	33	33	33
Lower North Powder River				
WFH	1	1	1	1
WFH RHCA	0	0	0	0
Middle North Powder River				
WFH	1008	788	1008	809
WFH RHCA	180	153	180	177
Tanner Gulch Grande Ronde				
WFH	53	53	53	53
WFH RHCA	15	15	15	15
Upper Anthony Creek				
WFH	1,490	1,184	1490	1401
WFH RHCA	381	280	381	378
Upper Beaver Creek				
WFH	0	0	0	0
WFH RHCA	0	0	0	0
Upper Ladd Creek				
WFH	171	171	171	171
WFH RHCA	16	3	16	16
Upper Wolf Creek				
WFH	1965	1965	1965	1862
WFH RHCA	128	128	128	128
Totals				
Total WFH	**5,184**	**4,658**	**5,184**	**4,793**
Total WFH RHCA	**753**	**612**	**753**	**747**

Prescribed Fire

Prescribed fire intensity is expected to be low in riparian areas, having little effect on riparian conditions. Prescribed fire is not expected to be a source of erosion or sediment delivery. Agee et al. (2002) found that understory vegetation in riparian zones tended to be moister later in the season than in drier upland forests. In low elevation, interior forests such as those with ponderosa pine, Douglas-fir and grand fir, higher understory foliar moisture in riparian zones should dampen surface fire behavoir compared to upland forests late in the dry season. High foliar moisture in understory plants will be associated with lower surface fireline activities as fires approach the riparian zone, even when fire return intervals have been shown to be similar between riparian and upland sites (Olson, 2000).

Prescribed burning would occur when weather and fuel conditions are appropriate to meet the objectives and prescription. Prescribed burning would be accomplished within a 10 year period depending on environmental conditions needed to meet burning prescriptions. There will be no direct ignition within INFISH RHCAs, but fire would be allowed to back into RHCAs.

Alternative 2 proposes 6,685 acres of prescribed fire, Alternative 3 propose 6,043 acres, Alternative 4 proposes 6,643 and Alternative 5 proposes 6,685 acres (actual burn area). For prescribed fire, no direct ignition within RHCAs would be allowed. This would prevent direct effects to water quality. There would be no difference in the direct effects to water quality with the implementation of Alternatives 2, 3, 4, and 5.

Temporary Roads

Alternative 2 proposes the use of 12.62 miles of temporary road, 6.01 miles are existing wheel tracks and 6.61 miles are new and would be constructed for project use. Alternative 3 does not require new or existing temporary road use. Alternative 4 proposes 2.62, .67 miles on existing temporary roads and 1.95 miles of new construction and Alternative 5 proposes the use of 14.71 miles of temporary road, 6.57 on existing and 8.14 miles of new temporary roads. Table 74 shows temporary roads proposed in each alternative that require culvert installation and removal at stream crossings. Other activities associated with temporary roads, such as construction of new roads and location of roads in relation to streams and riparian habitat would have indirect effects to water quality and are discussed in the indirect effects section below.

Table 74 - Temporary Road Stream Crossings by Alternative

Temp Roads	Stream Class	Number of Stream Crossings			
		Alternative 2	Alternative 3	Alternative 4	Alternative 5
T-05 (Existing wheel tracks)	Class III	1	0	1	6
	Class IV	1	0	1	2
T-07 (Existing wheel tracks)	Class III	1	0	0	1
T-20 (Existing wheel tracks)	Class III	1	0	0	1
T-22 (Existing wheel tracks)	Class III	1	0	0	1
T-24 (Existing wheel tracks)	Class IV	1	0	0	1
T-26 (Existing wheel tracks)	Class I	1	0	0	1
T-01	Class IV	1	0	1	1
T-21	Class III	2	0	0	2
Summary	Class I	1	0	0	1
	Class III	6	0	1	11
	Class IV	3	0	2	4
Total Crossings		**10**	**0**	**3**	**16**

Class I=fishbearing, Class III=perennial non-fishbearing, Class IV=intermittent non-fishbearing

Because no temporary roads are proposed under Alternative 3 there would be no direct effects to water quality from temporary roads under this alternative. Alternatives 2, 4 and 5 would use a combination of existing wheel tracks and new temporary road construction to facilitate harvest/fuel reduction activities. Any temporary roads used would require culvert installation at stream crossings and culvert removal after completion of project activities. Heavy equipment instream activities associated with the installation and removal of culverts would have short term direct effects to water quality. An increase in sedimentation and turbidity would occur during instream activities. Culvert installation and removal in live streams would take place during the instream work window agreed to in the MOU with Oregon Department of Fish and Wildlife. All culverts would be removed and streambanks would be recontoured after completion of vegetation management treatment, during the same season of use.

Alternatives 2 and 5 both propose construction and use of T-20, T-21 and T-22 to access units 104, 105, and 145. Together these roads would cross Class III perennial streams 4 times and require three culvert installations and removals. The fourth stream crossing on T-22 has an existing log culvert that is partially plugged and collapsing and will need to be replaced to avoid complete failure of the culvert, which would introduce a large amount of sediment into the stream system. These crossings are a tributary to Indian Creek and are less than 0.25 miles from downstream bull trout habitat.

Alternatives 2, 4, and 5 propose use of T-05 to access unit 144 and units 164 and 165 (Alternative 5 only). Alternative 5 would require 8 stream crossings total on temporary road T-05, 6 Class III perennial stream crossings and 2 Class IV ephemeral stream crossings and Alternatives 2 and 4 would require 2 stream crossings, one on a Class III perennial stream and one on a Class IV ephemeral stream. Use of this road would cause direct effects to water quality from the installation and removal of culverts at stream crossings. Because Alternative 5 requires the most miles of road and stream crossings to access units 164 and 165, it would have the largest amount of potential direct effect to water quality through increased sediment input to stream channels from in water work.

Alternative 2 has 10 total stream crossings, all of which would need to have culverts installed with the exception of the Class I crossing on T-26, which has an existing log culvert in place. Alternative 5 has the highest number of stream crossings and therefore the highest number of culvert installations and removals needed. Similar to Alternative 2, the Class I crossing on T-26 would not need culvert replacement, so total culvert installations is 16, with 17 total culvert removals (existing log culvert on T-26 would be removed). Alternative 4 would require three stream crossings, one on a Class III perennial stream and two on Class IV ephemeral streams. In all alternatives culverts would be removed after vegetation management treatment and during the same season of use.

Culvert replacement would have a direct, short term (<48 hours after replacement) effect on water quality. Foltz (2008) studied sediment concentrations and turbidity changes during culvert removals. The study found that 95% of the culvert related sediment occurred in the first 23 hours after culvert removal in streams where flows were low. Where flow locations were higher, 40-95% of the culvert related sediment occurred in the first two hours. Culvert installation and removal in the East Face project would be similar to the low flow sites, since work would be required to happen during low flows and sediment concentrations and turbidity would be expected to return to preconstruction levels within 48 hours after replacement. Jakober (2002) found that after culvert replacement on the Bitterroot National Forest, sediment concentrations decreased to near pre-project levels within 24 hours.

Alternative 5 has the most miles of temporary road that would be required for project access; it also has the highest number of stream crossings that would require culvert installation and removal. Alternative 5 would have the highest amount of short term direct effects to water quality from sediment input caused by the mechanical placement and removal of culverts. Alternative 2 would also have a high amount of short term direct effects to water quality from in water work associated with culvert installation and removal at 13 stream crossings. Alternative 4 would have the least amount of impact from three stream crossings with culvert installation and removal on one Class III stream and two Class IV streams.

Closed Roads for Administrative Use

The miles of closed roads opened for administrative use is 107 miles for Alternative 2, 66.9 miles for Alternative 3, 38.6 miles for Alternative 4 and 122.7 miles for Alternative 5. Under all action alternatives, 6.5 miles of closed road would remain open after project completion. Under Alternatives 2 and 4 approximately 0.6 miles of road currently ML2, open to high clearance vehicles, would be closed after project activities are completed. The only direct effect to water quality from opening closed roads is reconstruction that would involve heavy equipment crossing live streams and culverts that would need to be installed. All other effects including streams crossed (with culverts in place), road miles in RHCA buffers and reconstruction miles in RHCA buffers where culvert installation is not needed are discussed in indirect effects to water quality and stream temperature.

Complete inventory of existing culverts and drainage structures on closed roads proposed to be opened for administrative use does not exist for East Face project area. It is assumed that most closed roads have culverts at stream crossings in place. In the case that culvert replacements or new installations would be necessary, the direct effects to water quality from in water activities associated with culvert installations and removal is the same as what is discussed above for temporary roads. Culvert installation to open the 7312160 road is discussed in Road Reconstruction below.

Road Reconstruction

Road reconstruction would vary from full reconstruction on some open and closed roads to incidental construction on other open and closed roads depending on the current condition and proposed use.

Maintenance of roads would be required to open closed roads in all project alternatives. The majority of maintenance activities such as brushing, blading and shaping of the road surface, cross drain culvert cleaning, and limited ditch cleaning would not occur instream but would occur on the road prism or immediately adjacent to the road prism and would not result in direct effects to water quality. These road maintenance activities are a potential indirect effect, which is discussed in the indirect effects to water quality section. Culvert installation would be required on certain roads proposed to be opened in some alternatives; this would have direct effects on water quality due to the instream work associated with installation.

Direct effects to water quality would result from the installation of the culvert in the Class III perennial non-fishbearing stream just upstream of the extent bull trout habitat on closed road 7312160 that is proposed to be opened for project access in Alternatives 2 and 5. This is approximately 0.25 miles above the extent of critical habitat for ESA listed bull trout. This culvert was removed during road storage activities and is proposed to be installed for hauling activities associated with fuel reduction activities. In addition open road 7312150 has at least one 18" cross drain removed, has plugged culverts and drainage problems that would potentially require a lot of culvert installation during reconstruction. It is not known how many other closed roads to be opened for project use need culvert replacements or new culverts to be installed due to removal during past road closure activities. Culvert installation would introduce a large amount of sediment into the stream system. Culvert replacements will have a direct, short term (<48 hours after replacement) effect on water quality. Foltz (2008) studied sediment concentrations and turbidity changes during culvert removals. The study found that 95% of the culvert related sediment occurred in the first 23 hours after culvert removal in streams where flows were low. Where flow locations were higher, 40-95% of the culvert related sediment occurred in the first two hours. Culvert replacement in the East Face would be more similar to the low flow sites, and sediment concentrations and turbidity would return to preconstruction levels within 48 hours after replacement. Jakober (2002) found that after culvert replacement in the Bitterroot National Forest, sediment concentrations decreased to near pre-project levels within 24 hours.

In addition, road 7312150 is within an RHCA for 0.61 miles and is adjacent to North Fork Anthony Creek for approximately 2.1 miles. There are three Class III perennial stream crossings on this road that are tributaries to North Fork Anthony Creek. This road requires total reconstruction in close proximity to bull trout habitat.

Use of BMPs such as conducting activities when streamflows are low, development of a Pollution and erosion control Plan (PCEP), delineating construction impact areas on project plans and confining work to the noted area, and rehabilitation of disturbed areas by mulching and seeding would minimize sediment yield. Vegetation will only be removed if necessary to complete realignment. The culvert would be sized to prevent the degradation of streambanks and maintain integrity of the stream channel and stream processes. Culvert installation and removal would occur during the instream work window specified in Oregon Department of Fish and Game Guidelines for Timing of In-Water Work (2008).

Road Decommissioning

The 31.3 miles of roads identified for decommissioning under all action alternatives are everything from currently open to overgrown and naturally decommissioned. Naturally decommissioned roads would not require actions beyond removing the road sign and removing the road from the transportation system. Road decommissioning activities would take place when road conditions are dry. There are no direct effects to water quality from road decommissioning.

Wolf Creek Culvert Replacement

Replacing the culvert on road 431680 that crosses Wolf Creek is proposed in Alternatives 2-5. This would have an overall beneficial affect and improve fish passage to 5.2 miles of upstream habitat. There would be an increase in sediment and turbidity during and after instream work associated with removing and installing the new culvert. The increase in sediment and turbidity would have short term direct effects to water quality. To mitigate for the effects of construction on water quality, the stream crossing site would be dewatered at time of installation and rewatered after the culvert is installed. See discussion above regarding culvert installation and sediment.

This culvert will be replaced during the instream work window July 1-August 31 specified in Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources (2008) in order to ensure the least potential effect to fish within the system at the time of the activities. There would be no difference in direct effects to water quality in Alternatives 2-5.

North Fork Anthony Creek Bridge Replacement

The 7312 road is the primary haul route for the East Face project area. Due to weight limitations which will not support log haul on the bridge on the 7312 road over the North Fork of Anthony Creek, the old bridge would be physically removed and a new bridge would be installed. Removal of the existing bridge and installation of the new bridge could have direct effects on water quality if any equipment enters the channel or excavator work is necessary to build slopes and abutments. Effects would be the same in Alternatives 2-5.

Indirect Effects to Water Quality

The project activities that would have indirect effects on water quality are opening and hauling on closed roads that have stream crossings or are in RHCAs, reconstructing closed roads that are near live streams and within RHCAs, constructing new temporary roads that are draw bottom or in RHCAs, and handwork within RHCAs.

ALTERNATIVE 1 - NO ACTION

With the non-treatment of stands, fuel conditions in stands, both fuel loadings and accumulation, will be excessive and the likelihood of a high intensity fire occurring is high. Fires have the potential to damage adjacent stands and RHCAs. Interconnected, fuel laden stands may now link areas that historically burned less frequently or uniformly into large, homogeneous areas that are vulnerable to high intensity stand replacing events (Agee 1988; Henjum et al. 1994). Under certain circumstances, such as through fuel accumulations and a hot dry period, riparian zones can act as passages for fire leading to the spread of fire to unburnt uplands (Agee 1998). Under particular conditions, steep sided canyons can act to funnel winds increasing wind speeds that may increase fire rate of spread and operate as a conduit for fire to different parts of the landscape (Dwire and Kaufman 2003). Under some circumstances climatic pre-fire conditions can drive large and intense fires in riparian zones with significant ecological impacts (Pettit and Naiman 2007).

Riparian fires can lead to an increase in sediment yield to stream channels as well as an increase in streambank erosion. The major physical effects of riparian fire are an increase in the likelihood of bank erosion, and the large fluctuations in the delivery of woody debris in the riparian zone and in the stream. Fire increases erosion in the riparian area by removing vegetation, increasing surface runoff, and reducing soil infiltration rates. Fire reduces infiltration rates by creating a hard soil surface crust which is often hydrophobic, and combined with loss of ground cover leads to sheet or gully erosion (Shakesby and Doerr 2006). Fire can destroy accumulated forest floor material and vegetation, altering infiltration by exposing soils to raindrop impact or creating water repellent conditions (DeBano et al. 1998). Loss of soil from hillslopes produces several significant ecosystem impacts. Soil movement into streams may degrade water quality and change the geomorphic and hydrologic characteristics of these systems (Robichaud et al. 2000). Sediment delivery following forest operations and prescribed fire with forested buffers are a magnitude or more lower than following wildfire, and the increased number of disturbances from active forest management result in lower long term average sediment delivery rates than would occur following less frequent wildfire disturbances (Elliot and Robichaud 2001).

Stands and RHCAs proposed for precommercial thinning in the project area are overstocked. In many instances, stress, particularly drought stress, is compounded by overstocking (Fiddler, et al., 1995). This stress can lead to losses in tree growth and increases in insect and disease caused mortality. If left untreated, overstocked stands and RHCAs would stagnate, and tree diameters would remain in smaller size classes (an average of less than eight inches dbh) until a disturbance occurs such as fire, insect infestation or disease. The risk associated with insects and disease is that these could cause an epidemic in adjacent stands and RHCAs resulting in an increased risk of wildfire, increase in sediment yield to perennial and fishbearing streams in the event of a high intensity fire, and long term loss of wood recruitment and structure to stream channels and hillslopes. Non-treatment of stands and RHCAs could increase sediment yield to stream channels above existing levels under this alternative due to an increase in fire intensity. Appropriate stocking levels can help to increase tree growth and increase resistance of stands to fire, insect, and disease (Lambert, 1994).

High intensity fire within and adjacent to RHCAs has the potential to reduce the long term recruitment of large wood to stream channels. The pulse of snags, logs, and coarse wood generated by a stand replacement fire is the recovering forest ecosystem’s sole source of coarse wood until the new stand begins to generate snags and logs of comparable size and heartwood content, which generally takes 150 to 200 years in some forest types (Maser et al. 1988, Franklin et al. 2002, Harmon et al. 2004). Excessive heat from fires has the potential to cause soil sterility, thereby reducing future regeneration success. Severe site conditions can slow natural regeneration of coniferous trees following a stand replacement burn (Noss et al. 2006).

Non-treatment of RHCAs and stands could result in a long term loss of large wood recruitment to stream channels and hillslopes needed for sediment retention and channel structure, increased loss of RHCAs to wildfire, and could increase sediment yield to stream channels in the event of a high intensity wildfire.

Stream Temperature

With the non-treatment of stands, including RHCA treatments, fuel loadings and accumulation would continue to be excessive and the likelihood of a high intensity fire occurring is high. Fires have the potential to damage adjacent stands and RHCAs. Fires in riparian areas have the potential to elevate stream temperatures. Changes in channel form and reduction in riparian canopy cover due to fire led to elevated stream temperatures for extended periods of up to 10 years in a British Columbia headwater stream (Moore et al. 2005). In smaller streams, riparian fires can defoliate trees, resulting in more light reaching the stream thereby increasing water temperature as well as growth of aquatic and emergent plants (Pettit and Naiman 2007).

ALTERNATIVES 2, 3, 4, and 5

The primary benefits of stand and fuels treatment adjacent to RHCAs and handwork within RHCAs would be ensuring a long term source of large wood recruitment within RHCAs to hillslopes and stream channels for sediment retention, channel structure, riparian function, and reduced risk of a high intensity fire that could lead to sediment yield in fishbearing streams.

Pre-commercial thinning would reduce stocking densities in overstocked stands leaving the healthiest and most vigorous trees that meet species and stocking requirements. This would result in larger trees with fuller crowns in the RHCA for recruitment to stream channels and hillslopes for sediment retention, channel structure, and stream shade. In addition, there would be a decreased risk of insect and disease infestation in adjacent stands, including overstocked conditions and ladder fuels in RHCAs, which, if left untreated, could contribute to higher fire intensities than those that would have occurred historically leading to a long term (>100 years) reduction of large wood recruitment and potential increase in sediment yield to streams.

The most documented effect of precommercial thinning is increased diameter growth caused by the redistribution of the environmental resources among a smaller number of selected trees. When the number of stems per hectare is very large, the leaf area of each tree could be so limited that few carbohydrates are available for height development and stagnation of growth occurs (Pothier 2002).

The primary benefits of stand and fuels treatment on stream temperature is reducing the risk of high intensity fire to adjacent RHCAs. Treatment of stands and fuels reduction will reduce the risk of the loss of stream shade, which could lead to elevated stream temperatures. Pre-commercial thinning would result in larger trees with fuller crowns in the RHCA for stream shade. In addition, there would be a decreased risk of insect and disease infestation in adjacent stands and RHCAs, which could contribute to higher fire intensities.

Typical riparian conditions such as wide spacing and mixed conifer or hardwood stands allow later crown closure than tightly packed plantations (Berg 1995). Homyack et al. (2004) found that stands thinned six to 11 years prior to the study had a greater overstory structure than similar untreated stands. In contrast, unthinned stands gained little overstory structure indicating that the application of pre-commercial thinning was responsible for the accelerated height and diameter growth.

Summary of Benefits – More of the benefits described above would be realized under Alternatives 5, 2 and 4 than Alternative 3 related to stand management outside of riparian areas. Alternatives 2 and 4 would treat the most riparian acres (992 acres) followed by Alternative 3 (837 acres) and Alternative 5 (791 acres); therefore, generating the most benefits to riparian vegetation health, vigor, and sustainability over time.

Commercial Removal

Commercial removal includes (HFU, HIM, HPO, HPO, HPR, HSA, HSH, HTH, WFH-BIO, and PCT-BIO) units. Table 2 describes the number of acres to be commercially harvest and the acres of each logging system to be used to facilitate log removal. Generally, skyline yarding is used on ground with slopes >35% for removal of material, and ground based equipment is used on ground with slopes <35%. Table 75 shows the total number of acres of commercial removal by subwatershed.

Table 75 - Acres of commercial treatment by subwatershed

Subwatershed	Alternative 2 Acres	Alternative 3 Acres	Alternative 4 Acres	Alternative 5 Acres
Lower North Powder	44	0	44	60
Middle North Powder	1,095	479	1,016	1,095
Upper Anthony Creek	1,247	939	738	1,248
Lower Anthony Creek	1,052	455	272	1,741
Upper Wolf Creek	1,815	951	656	2,029
Upper Ladd Creek	175	142	95	175
Upper Beaver Creek	1,290	911	18	1,311
Tanner Gulch-Grande Ronde	0	0.5	0	0.5
TOTAL Acres	**6,719**	**3,877**	**2,839**	**7,659**

Best management practices and RHCA buffer widths would be used as no activity stream buffers for commercial removal activities which would prevent indirect effects to water quality and stream temperature. Rashin et al. (2006) demonstrated the effectiveness of best management practices for controlling sediment related water quality impacts from timber harvest activities. Rashin et al. found that stream buffers were most effective where timber falling and yarding activities were kept at least 10 meters (approximately 33 feet) from streams and outside of steep inner gorges. This 10 meter buffer for ground disturbing activities was found to prevent sediment delivery to streams from about 95% of harvest related erosion features. Of 193 erosion features located 10 meters from the stream channel, 95% did not deliver sediment. Rashin et al. found that virtually all chronic sediment delivery was associated with skid and shovel trails that crossed streams. There would be no stream crossings with equipment of any perennial fishbearing streams within the project area.

Lakel et al (2010) studied four streamside buffer widths or streamside management zones (SMZs) for the effectiveness of sediment retention after forest harvest and site preparation. The study was conducted in the Piedmont physiographic region of Virginia. Piedmont soils are highly susceptible to erosion. All SMZs had intact litter layers and were similarly effective for trapping sediment. Side slopes within the study watersheds averaged 25% and ranged from 10% to 65%. The four SMZs studied were:

- 7.6 meters (24.9 feet) with no thinning in the SMZ,
- 15.2 meters (49.9 feet) with no thinning in the SMZ,
- 15.2 meters (49.9 feet) with thinning within the SMZ with 30% to 50% basal area removed,
- 30.4 meters (99.7 feet) with no thinning in the SMZ.

Treatments included clearcut harvest; dozer created firelines between harvest, and SMZs, and prescribed fire. Results indicate that 97% of eroded materials were trapped within the harvest area or the SMZ before reaching the stream, and that pre-harvest and post-harvest sediment data was not significantly different for the four SMZ treatments. Three of the study watersheds had sediment bypass the SMZ regardless of SMZ width and the apparent causes were failed water control structures associated with road segments or firelines on steep, fragile soils that concentrated flow creating scouring and minor channel formation. In contrast, there would be no dozer created fire lines within the project area during harvest activities, commercial fuel reduction activities are proposed only outside of the RHCA stream buffers.

The stream buffers widths are also based on the riparian microclimate in the Blue Mountains of Oregon. Microclimate is an important element of ecosystem management as it influences biological processes such as primary production and decomposition, and the physical environment determining habitat suitability for many organisms (Chan et al. 2004).

Danehy and Kirpes (2000) found that the riparian microclimate gradient on four perennial streams in the Grande Ronde Basin of eastern Oregon extended no more than10 meters (30 feet) from the edge of the stream channel into the upland forest. Beyond 10 meters humidity was similar to upland conditions. Indian Creek, a perennial stream in the Upper Grande Ronde River, was one of the study streams and has similar habitat conditions to many of the streams within the East Face area. The minimum RHCA stream buffers would protect the riparian microclimate, which includes stream temperature.

A study conducted by Chan et al. (2004) on four different buffer widths with upland density management (thinning) suggest that riparian buffers of various configuration results in relatively small changes in the riparian climate. Buffer widths in the study were: 1) streamside retention (less than 25 feet); 2) variable width (about 57 feet); 3) one site potential tree width (about 201 feet); and 4) two site potential tree widths (about 400 feet). The study involved small headwater streams, and results of the study found that the area between the stream and 15 feet lateral distance from the stream is uniquely riparian with respect to microclimate. This 15 foot zone is remarkably resistant to microclimate changes from upland thinning treatments.

A study conducted by Wilkerson et al. (2006) in headwater streams in Maine found that 11 meter (36 feet) buffer widths with clearcuts on either side and partial harvest within the buffer had moderate, but statistically insignificant increases in stream temperature while 23 meter (76 feet) buffer widths with clearcuts on either side and partial harvest in the buffer had no observable increases in temperature. Both treatments retained >60% of the canopy. Moore et al. (2005) found that temperature increases in headwater streams are unlikely to produce substantial changes in the temperature of larger streams into which they flow, unless the total inflow of clear-cut heated tributaries constitutes a significant proportion of the total flow in the receiving stream. No clearcut or regeneration harvests are proposed along perennial streams and no harvest is proposed within no-activity buffers. All shade producing vegetation will be retained within no treatment buffer, and a fully stocked stand will remain beyond the buffers to provide stream shade.

Based on the above studies, no activity stream buffers would prevent or minimize sediment yield resulting in a non-measurable amount of sediment reaching the stream, and would not result in an increase in stream temperature.

Precommercial Thinning (PCT)

Precommercial thinning acres proposed for treatment under Alternatives 2-5 are described in Table 23. The majority of proposed precommercial thinning acres would occur outside of RHCA buffers, however some acres of RHCA thinning is proposed in each alternative to improve conditions of riparian stands. See Table 4 for acres of PCT treatment inside and outside of RHCA buffers by subwatershed.

Below are the indirect effects of precommercial thinning outside and inside of RHCAs.

PCT- Outside of RHCAs

Alternatives 2, 3, 4 and 5 propose acres of precommercial thinning (PCT units) outside of RHCAs. Precommercial thinning outside of RHCAs includes handwork on slopes >30% and the use of handwork or slashbusters (mastication) on slopes <30%. Mechanical thinning activities would be outside of RHCAs, which would prevent indirect effects to water quality in a manner similar to that described under commercial harvest above.

PCT- Within RHCAs

All Alternatives propose acres of precommercial thinning (PCT units) in old harvest units within RHCAs. Thinning of overstocked trees <9 inches dbh, and hand piling and burning of slash would occur in old harvest units within RHCAs. Trees would be thinned to a 14 by 16 foot variable spacing. Stream buffers for WFH PCT are based on the riparian microclimate. For precommercial thinning by hand within RHCAs, minimum no activity stream buffers of 10 feet on Class IV streams (intermittent non-fish bearing), 30 feet on Class III streams (perennial non-fishbearing, and 50 feet on Class I streams (fishbearing) would be implemented. Depending on the amount of slash generated, hand piling and hand burning of slash piles within RHCAs outside of minimum no activity stream buffers may be required to address fuel accumulations. PCT units with RHCA hand treatment include units 304, 305, 308, 309, 314, 318, 319, 320, 326, 327, 332, 333, 368, 376, 382, 387, 399, 410, 418, 420, 422.

Work within RHCAs would be conducted by hand, which would result in minimal ground disturbance. A study conducted by Madrid et al. (2006) evaluated three silvicultural treatments, which are 1) untreated control, 2) precommercial thin with slash piled, and 3) precommercial thin with slash scattered. Treatments were done by hand. Fuels reduction and thinning within RHCAs in the East Face project are similar to the treatment described in number two above, precommercial thin with slash piled. Ground disturbance in the pile treatment ranged from no ground disturbance to slight roughing of the litter with slight exposure of mineral soil where slash was hauled to piles. Sediment yield was statistically different and greater on pile and scatter treatments than the untreated control or thin and pile treatments during wet runs (precipitation). Median sediment yield for the untreated control was 0.36 kg ha-1, thin and pile treatment was 0.83 kg ha-1, and the thin with slash scattered was 0.90 kg ha-1. Sediment yield for both treatments was still very low and within erosion rates of undisturbed forested watersheds. Studies have reported that undisturbed forested watersheds have erosion rates from near 0 to 560 kg ha-1 (Binkley and Brown, 1993). Median values modeled for both dry and simulated storm events were below 2 kg ha-1. The values for thin and pile are very close to zero and well within background levels for erosion rates of undisturbed forested watersheds. Amount of sediment generated by this activity is not measurable since the values described above are very close to zero and are the background levels of natural sediment yield in undisturbed forested watersheds. The study concluded that infiltration rates, runoff rates, and soil moisture content did not differ among treatments.

Best Management Practices monitoring on the La Grande Ranger District supports these research findings. Mechanical treatment in RHCAs in the Starkey and Horsefly Vegetation Management Projects found that there was no offsite movement of sediment, no sediment movement through the no-treatment stream buffers of 50 feet on perennial and 30 feet on intermittent streams, and no sediment yield to stream channels. This was mechanical treatment. Hand treatment results in minimal to no ground disturbance, does not compact soils, and would result in very small amounts of sediment that would not be measurable above background levels. With handwork there are no skid or shovel trails that cross streams or any other mechanical ground disturbance. The stream buffers described for hand treatment allow optimum hand treatment of the RHCA with no risk of adverse effects to listed fish or designated critical habitat.

Fire intensity in thinned stands is greatly reduced if thinning is accompanied by reducing the surface fuels created by the cuttings (Graham et al. 1999). A study conducted by Kalabokidis and Omi (1998) found that thinning combined with slash treatment is an effective means for reducing fire spread, reducing the resistance to control, and reducing ecological losses. Thinning with no slash modification is an inappropriate option because more fuel becomes available for combustion contributing to extreme fire outcomes such as crowning and erratic fire behavior. Slash fuels increase the fire hazard as long as they remain on the ground, so prompt treatment with prescribed fire or mechanical means is important (Fule et al. 2001).

Hand piling and hand burning of small piles are not a source of erosion, do not create overland flow, and therefore are not a source of sediment to stream channels. Seymour and Tecle (2004) conducted a study of the effects of burning hand piled slash on physical soil characteristics of soil bulk density, soil porosity, infiltration capacity, and soil moisture content. The size of hand piles studied were small, round hand piles 1.2 meters high (3.9 feet) and 2.4 meters in diameter (7.9 feet); and large hand piles 2 meters high (6.6 feet), 4 meters wide (13 feet), and 5 meters long (16 feet). Unburned large and small hand piles and control treatments were used to measure differences in physical soil characteristics between treatments. Study results indicate that there were no significant differences in soil bulk density and porosity, soil infiltration capacity, or soil moisture between treatments. Since bulk soil density and porosity were not significantly affected, soil infiltration rates were not reduced indicating the absence of the formation of a hydrophobic layer that could lead to overland flow and erosion.

Precommercial thinning slash hand piles within RHCAs would be similar in size to the “small” hand piles described in the study above, and average size of piles would be approximately four to five feet high and eight feet in diameter. Piles would be burned when there would be a high soil moisture content and would result in a low intensity burn to minimize effects to soils and vegetation. An inspection of small diameter burn piles, similar to those described above, in the South Fork Catherine WUI Project area within the RHCA of a perennial stream found good soil moisture and infiltration in the footprint of burn piles and virtually no erosion or offsite movement of sediment. It was determined that the small burn piles retained roughness and soil infiltration, and also lacked the surface area and hydrophobic soils needed to create overland flow. This verifies the results of the research described above.

Sediment yield from precommercial thinning and hand piling and burning of slash would be very close to zero due to minimal ground disturbance, and well within the background levels of sediment yield in undisturbed forested watersheds. Given that small burn piles are not a source of sediment, that there will be minimal ground disturbance in the RHCA, and that minimum no activity stream buffers will retain the small amount of sediment, there will be a negligible effect to water quality.

There would be no difference in the indirect effects to water quality with the implementation of Alternatives 2, 3, 4 or 5 since no activity stream buffers would be implemented and adequately protect water quality as described above. PCT activities and effects within RHCAs are very similar to WFH activities and effects in RHCAs.

Stream Temperature

A minimum 50 foot no activity stream buffer on fishbearing streams and minimum 30 foot buffer would prevent removal of shade producing vegetation and alteration of stream temperatures. Only small diameter understory trees, <9 inches dbh would be thinned and all overstory trees would remain. Intermittent non-fishbearing streams within the project area are typically dry by mid-June and do not contribute to summer stream temperatures and are therefore not an issue for maximum stream temperatures. No overstory trees would be removed from within RHCAs that could increase stream temperatures.

The 50 foot and 30 foot minimum no activity stream buffers are based on the riparian microclimate. Microclimate studies are discussed under the indirect effects of Commercial Removal section above.

Fuels reduction handwork within RHCAs would not increase stream temperatures due to the minimum 50 foot no activity buffer on fishbearing streams, minimum 30 foot no activity stream buffer for perennial no-fishbearing streams, thinning prescriptions, and no overstory removal in RHCAs. Understory thinning would occur, and the overstory canopy would remain intact to provide stream shade.

There would be no difference in the indirect effects to water quality with the implementation of any of the action alternatives.

Fire Fuels Treatment (FFU)

A total of 90 acres of fire fuels treatment is proposed in Alternative 4 only. See Table 71 for total acres of FFU treatment by subwatershed. All of these acres are outside of RHCAs.

Fuels reduction outside of RHCAs includes mechanical treatment using a slash buster (mastication) and piling slash with a grapple pile machine. For FFU units RHCA buffer widths would be implemented as minimum no activity stream buffers and would prevent indirect effects to water quality from fuels reduction activities outside of RHCAs.

Fuels Hand Treatment (WFH)

As described in Table 23 a total of 5,184 acres of fuels reduction work by hand is proposed in Alternative 2 and 4 with 4,430 acres of that outside of the RHCAs. In Alternative 3 approximately 4,658 acres are proposed with 4,047 acres outside of the RHCA and in Alternative 5 would treat 4,793 acres with approximately 3,561 acres outside of RHCAs. Fuels reduction work would be conducted by hand only (no mechanical treatment).

Outside RHCAs

Due to the implementation of no activity RHCA buffers, there would be no indirect effects to water quality under all action alternatives from hand fuels treatments.

Within RHCAs

Fuels reduction work within RHCAs would be conducted by hand only (no mechanical treatment). RHCA areas would receive the same fuels reduction treatments as those outside of the RHCAs. Alternatives 2 and 4 propose 754 acres of fuels reduction work by hand in RHCA's, Alternative 3 proposes 612 acres, and Alternative 5 proposes 746 acres. Minimum RHCA buffers would be the same as those described for precommercial thinning RHCA treatments. Hand piling and hand burning of slash piles within RHCAs may be required to address fuel accumulations. Small diameter material created from fuels reduction would be hand piled and burned by hand, and would occur outside of no activity stream buffers. Burn piles within RHCAs would be approximately four feet in height and six feet in diameter, spaced to avoid damaging or killing overstory trees, and would be burned when there is a high soil moisture content resulting in a low intensity burn to minimize effects to soils and vegetation.

Because no activity stream buffers would prevent indirect effects to water quality (sediment and stream temperature) there would be no difference in the indirect effects to water quality with the implementation of Alternatives 2-5 from those described under precommercial thinning within RHCAs above.

Prescribed Fire

Alternative 2 and 5 propose 6,685 acres of prescribed fire, Alternative 3 proposes 6,043 acres and Alternative 4 proposes 6,643 (actual burn area). Prescribed burning would occur when weather and fuel conditions are appropriate to meet the objectives and prescription. Prescribed burning would be accomplished within a 10 year period depending on environmental conditions needed to meet burning prescriptions. There will be no direct ignition within RHCA buffers, but fire would be allowed to back into RHCAs.

The use of prescribed fire would not increase sediment delivery rates to stream channels over and above the natural sediment rates of the subwatershed. There would be no direct ignition within INFISH RHCAs, but fire would be allowed to back into RHCAs. The fire intensity is expected to be low in riparian areas, having little effect on riparian conditions. Prescribed fire is not expected to be a source of erosion or sediment delivery.

Agee et al. (2002) found that understory vegetation in riparian zones tended to be moister later in the season than in drier upland forests. In low elevation, interior forests such as those with ponderosa pine, Douglas fir and grand fir, higher understory foliar moisture in riparian zones should dampen surface fire behavior compared to upland forests late in the dry season. High foliar moisture in understory plants will be associated with lower surface fireline activities as fires approach the riparian zone, even when fire return intervals have been shown to be similar between riparian and upland sites (Olson, 2000).

Control lines would include roads, natural barriers (rock outcrops, rock bluffs, rocky scabs etc.), and brush removal rather than bare mineral soil line construction where possible.

There would be no difference in the effects to water quality between Alternatives 2 and 5 as a result of prescribed fire since the same acres are proposed for both alternatives. Alternative 4 has slightly fewer acres of prescribed fire and Alternative 3 has about 600 acres fewer. No indirect effects are expected in an alternative since RHCA buffers will be implemented and only a minimal amount of RHCA may burn in the event that prescribed fire backs into an RHCA.

Stream Temperature

Prescribed burning would occur when weather and fuel conditions are appropriate to meet the objectives and prescription. Prescribed burning would be accomplished within a 10 year period depending on environmental conditions needed to meet burning prescriptions. There would be no direct ignition within RHCA buffers, but fire would be allowed to back into RHCAs. See Table 75 for total acres of prescribed fire by subwatershed.

The use of prescribed fire would not increase stream temperatures because of the no direct ignition within RHCA requirements allowing fire to only back into RHCAs. The fire intensity is expected to be low in riparian areas, having little effect on riparian vegetation or the conifer overstory.

There would be no difference in the effects to stream temperature between Alternative 2 and Alternative 5 as a result of prescribed fire since the same acres are proposed for both alternatives. Alternative 4 has slightly less acres of prescribed fire and Alternative 3 has about 600 acres less. No indirect effects to stream temperature are expected in any alternative since RHCA buffers would be implemented and only a minimal amount of RHCA may burn in the event that prescribed fire backs into an RHCA.

Temporary Roads

Alternative 2 proposes the use of 12.62 miles of temporary road, 6.01 miles are existing wheel tracks and 6.61 miles would be new construction for project use. Alternative 3 does not require temporary road construction. Alternative 4 proposes 2.62, .67 miles on existing wheel tracks and 1.95 miles of new construction and Alternative 5 proposes the use of 14.71 miles of temporary road, 6.57 on existing wheel tracks and 8.14 miles of new temporary roads. Table 76 shows the miles of temporary road in RHCA by alternative. The number of stream crossings where culverts would be installed and removed is located in Table 74. Building new temporary roads is expected to have more indirect effects to water quality due to vegetation and soil disturbance associated with clearing vegetation and roadbed construction compared to use of existing wheel tracks, which would require less construction.

Table 76 - Miles of Temporary Road in RHCAs by Alternative

Temp Roads	Miles of Road in RHCA			
	Alternative 2	Alternative 3	Alternative 4	Alternative 5
T-05 (existing wheel tracks)	.13	0	.13	.5
T-06 (existing wheel tracks)	.03	0	0	.03
T-07 (existing wheel tracks)	.21	0	0	.21
T-20 (existing wheel tracks)	.07	0	0	.07
T-22 (existing wheel tracks)	.12	0	0	.12
T-24 (existing wheel tracks)	.64	0	0	.64
T-25 (existing wheel tracks)	.25	0	0	.25
T-26 (existing wheel tracks)	.20	0	0	.20
T-1	.04	0	.04	.04
T-10		0	0	
T-17	.08		0	.08
T-20 (new)	.04	0	0	.04
T-21	.17	0	0	.17
T-35	.05		0	.05
T-39		0	0	.07
Total Miles New	**0.38**	**0**	**0.04**	**0.44**
Total Miles Existing Wheel tracks	**1.64**	**0**	**0.13**	**2.02**
Total Miles	**2.01**	**0**	**0.17**	**2.46**

Alternative 3 does not propose use of temporary roads and would therefore have no indirect effects on water quality or stream temperature from temporary roads.

Alternative 2, 4, and 5 each have temporary roads within RHCA buffers; the majority of them are existing wheel tracks with the remainder being primarily less than 400 feet in length. Most temporary roads in Alternatives 2, 4 and 5 are located in uplands outside of RHCAs; however, Table 76 displays the miles that are located in RHCA buffers or draw bottom roads and would have indirect effects on water quality and stream temperature. Installation and removal of culverts was discussed in direct effects to water quality.

Alternatives 2 and 5 would have the most indirect effects to water quality from crossing Class I fish bearing stream, and Class III perennial streams and from miles of road that will be used for hauling in the RHCA buffers. The new and existing wheel track temporary roads that have highest risk to water quality that are proposed to be constructed and used in Alternatives 2 and 5 are T-24, T-25, T-26, T-22, and T-07. The T-24 road is in the valley bottom and is in very close proximity to a Class I bull trout stream for approximately 0.5 miles. The road is within 15-20 feet of Class I habitat until it splits with the T-25 and the T-25 is immediately adjacent to Class I habitat for another 0.25 miles. Temporary road T-26 crosses East Fork of Indian Creek, Class I habitat, and is in the buffer of Class I crossing for 0.2 miles. Due to the proximity of this road to fish bearing habitat and Class III habitat immediately upstream of Class I habitat, opening this road and using it for hauling would cause a continued source of sediment to fishbearing Indian Creek and the east fork of Indian Creek. Temporary roads T-20, T-21 and T-22 together cross Class III perennial streams four times. The only crossing structure on this road is an old log culvert at the crossing as the road enters unit 104 and it plugged and collapsing and is causing water to run down the road. This structure will need to be replaced. Temporary road T-07 (proposed for use in Alternatives 2 and 5) is in a draw bottom for its 0.21 length. The road is immediately adjacent to Class III habitat. Due to the location this would contribute sediment to the adjacent stream during project operations in Unit 61.

Alternative 4 proposes 2.67 miles of temporary road use, but all roads are in the upland and outside of RHCA buffers except for 0.17 miles. The two roads that have some length within RHCA buffers are not the high risk temporary roads discussed above, however there are two stream crossings on road T-05, one Class III and one Class IV and one crossing on temporary road T-1 at a Class IV crossing. Some additional sediment would be expected at these locations from project road use and log haul operations; however, neither of these are drawbottom roads and the extent of road in the RHCA buffer is at the stream crossing.

Alternatives 2 and 5 pose the most risk to water quality due to the over 2 miles of temporary road in RHCA buffers and adjacent to streams and the use of roads T-24, T-25, T-26, T-22 and T-07 as discussed above. Alternatives 2 and 5 would potentially have more indirect effect to water quality due to the locations of these roads and the 13 and 20 stream crossings that would receive additional sediment associated with erosion from opening roads, road maintenance, and hauling operations. It is important to note with these roads of concern that the road beds already exist as wheel tracks on the ground and some roads that are not vegetated in or blocked with berms may currently receive unmanaged motor vehicle use. In Alternatives 2 and 5 these roads would be properly obliterated after completion of the harvest activities, eliminating potential for future motor vehicle use and impacts in these areas. Under Alternatives 3 and 4, they would remain in present condition and could receive unmanaged vehicle use.

All temporary roads would be built, used, and restored during the dry season and during the same season of use. After use, temporary roads will be subsoiled where appropriate, returned to original contours where needed and wood debris scattered across the footprint of the temporary road where debris is available. All stream crossing structures would be removed from the road prism and drainage across the road prism would be addressed to restore stream network connectivity.

Closed Roads Opened For Administrative Use

The miles of closed roads proposed to be opened for administrative use is 107 miles for Alternative 2, 66.9 miles for Alternative 3, 38.6 miles for Alternative 4 and 122.7 miles for Alternative 5. Under all action alternatives, 6.5 miles of closed road would remain open after project completion. Under Alternatives 2 and 4, 0.6 miles of road currently ML2, open to high clearance vehicles, would be closed after project activities are completed.

All action alternatives propose to open closed roads which cross streams, including fishbearing streams, and are within RHCA buffers. In Alternatives 2 and 5, the closed roads that would be opened have 7 Class I fishbearing stream crossings, 30 closed roads with 56 perennial non-fishbearing stream crossings (Class III), and 19 closed roads crossing 26 intermittent non-fishbearing streams (Class IV). Alternatives 3 and 4 each have one road that crosses one Class I fish bearing stream. Alternative 3 has 14 closed roads with 23 Class III perennial stream crossings and 12 closed roads with 18 Class IV intermittent stream crossings. Alternative 4 has 10 roads with 15 Class III perennial stream crossings and 7 roads with 9 intermittent Class IV stream crossings. Alternative 5 has 5 roads with 7 Class I fishbearing stream crossings, 28 roads with 52 Class III perennial stream crossings and 13 roads 20 Class IV intermittent stream crossings. Table 78 shows approximate total distance of RHCA buffers that these closed roads traverse. In addition, all alternatives had miles of open and closed road that need full reconstruction that are in RHCAs, depending on the reconstruction needed and ground disturbance necessary to reconstruct the road, there is potential for indirect effects on water quality. Alternatives 2 and 5 have the most miles of road to be reconstructed within RHCA buffers (see Table 77) and would likely have highest potential for indirect effects to water quality from sediment input to streams.

Closed roads used for the project will be reclosed after use and would consist of closing and locking of gates where present, or replacing earthen barricades. There are miles of closed draw bottom roads would be opened for project purposes in all Alternatives including 4315930 and 4300330. These roads are proposed to be used in Alternatives 2 and 3, 4315930 is also proposed to be used in Alternative 4 and 4300330 is proposed to be used in Alternative 5. Using alternative routes is preferable to opening and using drawbottom roads for access and hauling. Roads 43, 4330, 4350, and 4380 are all roads used in all action alternatives and are proposed to remain open to vehicular traffic. All have some serious drainage and erosion concerns and have miles within RHCA buffers.

Road Reconstruction

Table 77 - Miles of Reconstruction

Road Work	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Roads with full reconstruction	**52.9**	**39.3**	**27.8**	**61.6**
Open Roads	20.4	20.9	16.5	23.6
Closed Roads	32.5	18.4	11.3	38
Roads with incidental reconstruction	**35.5**	**18.2**	**16.5**	**42.2**
Open Roads	.1	.1	.1	.1
Closed roads	35.4	18.1	16.4	42.1
Total	**88.4**	**57.5**	**44.3**	**103.8**
Total miles of road reconstruction in RHCA buffer	43.6	30.9	18.8	49.26

Maintenance of closed roads may be required. Maintenance includes brushing, spot rocking, blading and shaping of the road surface, cross drain culvert cleaning, and limited ditch cleaning. A culvert on road 7312160 on a perennial Class III non-fish bearing stream was removed and would need to be installed in Alternatives 2 and 5 since both of those alternatives propose using that road. This culvert installation is less than .25 miles upstream of the extent of bull trout habitat. It is unknown how many other culverts on closed roads will need to be replaced or installed to open closed roads for project access and use. Any culvert installation will have direct effects on water quality.

The majority of maintenance activities such as brushing, blading and shaping of the road surface, cross drain culvert cleaning, and limited ditch cleaning would not occur instream but would occur on the road prism or immediately adjacent to the road prism.

Road maintenance can reduce sediment delivery to stream channels through improved drainage and reduced erosion of the road surface by directing water off of the road surface. Road maintenance is necessary to keep roads in good condition, minimize erosion, and identify and correct problems promptly (Furniss et al. 1991). Maintenance keeps roads in a condition suitable for travel and prevents severe erosion from failure of the drainage system (Luce and Black 2001).

Blading consists of pulling material from the sides of the road inwards to redevelop the road crown. All material would remain on the road surface. Luce and Black (2001) observed that blading of only the traveled roadway on an aggregate surfaced road with well vegetated ditches yielded no increase in sediment production from a complete road segment, while blading of the ditch, cutslope, and traveled roadway substantially increased sediment yield from road segments. Results from a study conducted by Luce and Black (2001) suggest that blading the ditch has a greater effect than traffic on sediment yield, and that ditch grading can increase sediment yields on a level comparable to or greater than wet weather hauling. Cleaning ditches and removing the cutslope vegetation caused a dramatic increase in sediment production. Sediment yields from older roads with undisturbed ditchlines are much smaller than sediment yields from newer roads or roads with disturbed ditchlines. Disturbance of the road surface alone through grading showed less effect. No cutslope grading or removal of vegetation from cutslopes is proposed for closed roads that would be opened for administrative purposes. No widespread ditch cleaning is proposed for closed roads. Some small scale, local, and scattered ditch cleaning may be needed. The majority of vegetated ditchlines would remain to trap sediment before reaching streams.

Brushing out of the road prism would not cause ground disturbance. Vegetation is trimmed back approximately six feet either side of the traveled roadway. Removal of some vegetation (brushing) may be needed where the closed roads cross through RHCAs. Vegetation would only be removed where it has grown over or into the road prism making travel difficult. No streamside vegetation would be removed. Only that vegetation within the road prism would be removed and would have no effect on stream temperature. Intermittent non-fishbearing streams within the project area are typically dry by mid-June and do not contribute to summer stream temperatures and are therefore not an issue for maximum stream temperatures.

Spot rocking will prevent rutting, erosion and puddling of the road surface. Swift (1984) investigated the influence of graveled, ungraveled, and grassed road surfaces on soil erosion. The study concluded that the graveled road surface with vegetated side slopes have the lowest soil loss compared to ungraveled and grass road surfaces.

Replacement of the culverts on closed roads as part of reconstruction for project use is discussed in direct effects to water quality above. Implementation of Best Management Practices would minimize indirect effects to water quality as a result of culvert replacement. A pollution control plan (PCP) would be used to protect water quality or respond to toxic spills that could threaten water quality.

Culvert replacement would not have an effect on stream temperature. Only that vegetation associated with the roadbed and culvert would be removed. No overstory vegetation would be removed. In addition, this is a very small corridor compared to the length of stream, and vegetation removed would not increase solar exposure to the point where stream temperatures would increase.

Roads will be used only under dry or frozen conditions to minimize sedimentation to stream channels. Prohibition of wet weather haul is an increasingly common best management practice that is effective in reducing sediment production from existing roads (Luce and Black 2001). Some types of impacts can be avoided simply by keeping people off roads during part of the year. This approach has been taken to decrease road surface erosion rates during wet weather (Ried et al. 1994).

The degree of sedimentation to stream channels above existing levels is expected to be low since roads would be used only under dry and frozen conditions and established vegetation on the road margins, sides of the road prism, and in ditches would be retained to filter and trap sediment.

Alternatives 2 and 5 would have the greatest potential for indirect effects to water quality because of the total miles of closed road open, miles of closed road open within RHCA buffers and the 89 and 79 stream crossings including 7 Class I fish bearing stream crossings and at least one known perennial Class III culvert installation on the 7312160 road. Alternative 2 has 19.2 miles of road that will be opened for project use that is within RHCA buffers and Alternative 5 has 17.29 miles within RHCA buffers. In addition Alternatives 2 and 5 have the highest amount of closed and open road miles to reconstruct within

RHCA buffers 43.6 in Alternative 2 and 49.26 in Alternative 5. Alternative 4 would have the least amount of indirect effects to water quality with 38.6 miles of closed road, 25 stream crossings including one Class I fish bearing stream and 4.94 miles in RHCA buffers compared to Alternatives 2, 3, and 5. Alternative 3 would have greater potential for indirect effects to water quality than Alternative 4, but less than Alternatives 2 and 5 with 66.9 miles of closed road to open, 9.53 miles in RHCA buffers and 42 stream crossings including one Class I fish bearing stream crossing. In addition, road reconstruction and use, such as log hauling over 107 and 122 miles of road has potential to increase sediment input at stream crossings.

Table 78 - Miles of Closed Road to be Opened in RHCA Buffers by Alternative

Total Road Miles	Miles			
	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	19.20	9.53	4.94	17.29

Road Decommissioning

Alternatives 2, 3, 4, and 5 propose the decommissioning of 31.3 miles of road as part of the Post Sale Road Management Plan. These roads would be decommissioned, returned to resource production and removed from the road system.

The roads identified for decommissioning are overgrown and naturally decommissioned. Naturally decommissioned roads would not require actions beyond removing the road sign and removing the road from the transportation system. Road decommissioning activities would take place when road conditions are dry. There are no indirect effects to water quality or stream temperature from road decommissioning.

Summary of Effects to Water Quality and Stream Temperature from Action Alternatives

- Commercial harvest units would have RHCA buffer widths implemented as no activity stream buffers. These would prevent direct and indirect effects to water quality and stream temperature throughout the project area.
- Hand treatment only within RHCAs combined with no activity stream buffers will prevent direct and indirect effects to water quality and stream temperature.
- Minimum no activity stream buffers for handwork proposed for fishbearing streams is based on the riparian microclimate and the prescription is for thinning only. Handwork within RHCAs would not result in an increase in sediment yield to streams, and would decrease stream shade or alter stream temperatures.
- There will be no direct ignition for prescribed fire within RHCAs.
- Alternatives 2, 4, and 5 proposed new and existing wheel track temporary roads located in RHCAs, which will have indirect effects to water quality.
- Alternatives 2, 4, and 5 all proposed temporary roads that would require installation and removal of culverts on Class I, III and IV stream crossings. This would have direct effects on water quality.
- All alternative proposed use of drawbottom roads that are closed and proposed to be open. This will have indirect effects to water quality and direct effects to water quality where culvert installation is necessary.
- Alternative 2 and 5 would have a greater degree of indirect effects to water quality than Alternative 3 and 4 since there are more stream crossings on closed roads opened for administrative project use. Alternatives 2 and 5 would open closed roads that cross 7 Class I fishbearing streams, Alternatives 3 and 4 would cross 1 Class I fishbearing stream.

- All Alternatives propose use of open and closed roads that require full reconstruction within RHCAs. Alternative 2 and 5 have the highest amount of miles to be reconstructed within RHCAs.
- All alternatives propose culvert replacement on road 4316800 where it crosses Wolf Creek, this would have direct short term effects on water quality.
- All Alternatives propose bridge replacement on North Fork Anthony Creek 7312. This is a Class I stream and removing and installing a bridge would have direct effects on water quality. If two pieces of equipment are used and no stream crossings with heavy equipment are necessary to install bridge, effects could be indirect in nature.
- Stand and fuels treatment adjacent to RHCAs and handwork within RHCAs would maintain/enhance the long term source (> 20 years) of large wood recruitment within RHCAs and stream channels.
- Treatment of stands, fuels reduction, and RHCA treatments will reduce the risk of a high intensity fire that could lead to the loss of stream shade, which could lead to elevated stream temperatures.
- All Alternatives would decommission 31.3 miles of road, some of these miles are in RHCAs, this will have an overall beneficial effect on water quality, improving watershed drainage.

Cumulative Effects to Water Quality

Potential cumulative effects are analyzed by considering the proposed activities in the context of present and reasonably foreseeable future actions. Reasonably foreseeable future actions are defined as within the next 5 years. Appendix D summarizes the present and reasonably foreseeable management activities that will occur in the cumulative effects analysis area and the determination of cumulative effects for water quality.

The logical area for cumulative effects to occur would be in the Middle North Powder, Upper Anthony Creek, Lower Anthony Creek, Upper Wolf Creek, Upper Ladd Creek, and Upper Beaver Creek Subwatersheds. This is where the majority of the East Face project activities are located and where cumulative effects could occur.

ALTERNATIVE 1 – NO ACTION

The potential cumulative effect to the subwatershed from the non-treatment of fuels and stands is an increased risk of high intensity fire that could potentially increase sediment yield to fishbearing streams, decrease stream shade, and reduce future recruitment of large wood to stream channels and RHCAs.

ALTERNATIVES 2, 3, 4 and 5

Project activities may contribute to cumulative effects since some short term sediment delivery above normal rates for the watershed is expected at all stream/road interactions in the project area during road related activities in East Face alternatives (refer to direct and indirect effects on water quality and fisheries).

Logging on adjacent state and private lands overlap in time and space with the East Face cumulative effects analysis area and have the potential to contribute short term increases in sediment to streams due to temporary road construction, reconstruction, and new road construction to facilitate log haul. While the Oregon Forest Practices act provides for riparian protection measures, these are less restrictive than those on adjacent Federal lands. In addition to the logging on state and private lands, the Limber Jim Fuels reduction project opens 47 miles of closed road which is adjacent to the northwestern portion of the project area. Twelve miles of those roads to be opened are within RHCA buffers. These effects are expected to be short in duration lasting for the amount of time in-water work occurs and until sediment is flushed downstream in the case of culvert installation and removal in or upstream of fish bearing streams, the amount of time closed roads receive traffic over stream crossings.

In addition, 3,643 acres of adjacent private lands are receiving precommercial thinning treatments, slashbusting, machine piling, and pile burning treatments currently with an additional 2,200 acres scheduled to be funded and begin in 2015/2016. These areas in addition to the timber stand improvement work in the East Face area, Limber Jim Fuels Reduction area, and the Blue Mountain Elk Initiative area would improve stand health, vigor, and sustainability across the landscape reducing susceptibility to insects and disease and increasing the long term potential for large woody debris recruitment to streams and RHCAs.

Although it would not be detectable at a subwatershed scale in this project area, the Wallowa-Whitman Travel Management Plan would manage motor vehicle use restricting it to designated roads, trails, and areas which would have the potential to minimize direct and indirect effects to water quality and fisheries resources resulting in beneficial effects.

There are five grazing allotments within the cumulative effects analysis area. Three are BLM and two are Forest Service, one Forest Service allotment is vacant and there are no plans to restock within the next five years. Improved management (primarily fencing and grazing strategies) for domestic livestock grazing have reduced impacts to riparian areas and stream channels due to the implementation of INFISH standards and guidelines. Vegetation management activities in East Face may open up stands and allow livestock to move through currently dense stands more easily increasing access to riparian areas previously not accessible to livestock and wild ungulates. There may be a potential for isolated instream impacts due to this increased access which would require site specific increased administration by the permittee where needed.

B. Effects to Fish Habitat and Populations

Direct Effects on Fish Habitat and Populations

ALTERNATIVE 1 - NO ACTION

There are no direct effects on instream fish habitat or populations as a result of the No Action alternative. Effects related to this alternative on fish habitat and populations are indirect.

ALTERNATIVES 2, 3, 4 and 5

Commercial Removal

Alternative 2 proposes the commercial harvest of 6,722, Alternative 3 proposes the commercial harvest of 3,879 acres, Alternative 4, 2844 acres and Alternative 5, 10,221 acres using ground based equipment, skyline yarding and helicopter removal. Commercial Harvest units along fishbearing streams (HIM, HOR, HPO, HPO/HIM, HSA, HSH, and HTH units) would have RHCA buffer widths implemented as no activity stream buffers. These will prevent direct effects to fish and fish habitat.

There is no difference in the direct effects to fish habitat and fish populations between Alternative 2, 3, 4 and 5 as a result of commercial removal.

Fire Fuels Treatment (FFU)

Alternative 4 propose 90 acres of fire fuels treatment in units 46, 66 and 147, see Table 71 for FFU treatments by subwatershed. FFU units include mechanical treatment, and INFISH RHCA widths would be implemented as no activity stream buffers. These will prevent direct effects to fish and fish habitat.

There is no difference in the direct effects to fish habitat and fish populations between Alternative 2, 3, 4 and 5 since no FFU treatments are included within RHCAs. There are no direct effects to fish habitat and fish populations from FFU treatments in Alternative 4.

Hand Fuel Reduction (WFH) Treatments Within RHCAs

Implementation of a minimum 50 foot no activity stream buffer on fishbearing streams would prevent direct effects to fish habitat and fish populations in Alternatives 2, 3, 4 and 5 as a result of hand fuels reduction activities within RHCAs.

Precommercial Thinning (PCT) Within RHCAs

All PCT treatments within RHCAs would be hand treatments. Alternative 2 and 4 propose 238 acres of precommercial thinning (PCT units) in old harvest units within RHCAs. Alternative 3 proposes 225 acres of PCT within RHCAs, and Alternative 5 proposes 45 acres of PCT within RHCAs, see Table 72 for acres of PCT treatments in RHCAs by subwatershed for each alternative. As described under water quality, pre-commercial thinning hand treatments within RHCAs minimum no activity stream buffers of 50 feet on fishbearing stream channels (Class I) would prevent direct effects to fish and fish habitat.

There is no difference in the direct effects to fish habitat and fish populations between Alternative 2, 3, 4, and 5 as a result of precommercial thinning within RHCAs.

Prescribed Fire

Prescribed burning would occur when weather and fuel conditions are appropriate to meet the objectives and prescription. There would be no direct ignition within INFISH RHCAs, but fire would be allowed to back into RHCAs. The fire intensity is expected to be low in riparian areas, having little effect on riparian conditions. There would be no direct effects to fish or fish habitat from the implementation of Alternative 2, 3, 4, or 5 in regard to prescribed fire.

There is no difference in the direct effects to fish habitat and fish populations between Alternative 2, 3, 4, and Alternative 5 as a result of prescribed fire.

Temporary Roads

Alternative 2 proposes the use of 12.62 miles of temporary road, 6.01 miles are existing wheel tracks and 6.61 miles are new miles that would be constructed for project use. Alternative 3 does not require temporary roads and therefore would have no direct effects to fish habitat and fish populations. Alternative 4 proposes 2.62, .67 miles on existing wheel tracks and 1.95 miles of new construction and Alternative 5 proposes the use of 14.71 miles of temporary road, 6.57 on existing wheel tracks and 8.14 miles of new temporary roads. Alternative 4 would require culvert installation on one Class III perennial non fishbearing stream and two Class IV intermittent streams and would not have any direct effects on fish habitat and fish populations. Alternatives 2 and 5 propose use of existing temporary road T-26. This road crosses Class I ESA listed bull trout stream, East Fork of Indian Creek. There is a culvert at this crossing, which would be removed after project activities are completed in units 113 and 114.There would be short term, localized direct effects to fish during in water work associated with removing this culvert. Short term sediment input into the channel would occur from mechanical removal of the culvert. See discussion on short term sediment impacts to water quality from culvert removals on page 12. Culvert removal would occur during ODFW in water work window guidelines (2008) to minimize effects to fish. Removing this structure will ultimately benefit fish passage and prevent potential impediments to fish passage at this crossing in the future.

Closed Roads for Administrative Use

The miles of closed roads proposed to be opened for administrative use is 107 miles for Alternative 2, 66.9 miles for Alternative 3, 38.6 miles for Alternative 4 and 122.7 miles for Alternative 5. Under all action alternatives, 6.5 miles of closed road would remain open after project completion.

Table 10 shows the closed roads to be opened, and stream classes that these roads cross. All alternatives propose to open roads that cross fish bearing Class I streams. Alternatives 2 and 5 have closed roads proposed to be open that cross 7 fish bearing streams, Alternatives 3 and 4 would open roads and cross 1 fish bearing stream. Road 4380200 proposed to be opened in Alternative 2 and 5 alone crosses 3 Class I fish bearing streams. There would be potential for effects to fish by opening these closed roads and increasing traffic and haul, but expected effects would be introducing sediment into channels from road use and would be indirect in nature. In addition, maintenance of closed roads would be required under all action alternatives.

Alternatives 2 and 5 would have the greatest potential effect on fish habitat or fish populations due to the 7 fishbearing Class I crossings. Alternatives 3 and 4 would have the least amount of direct effect on fish or fish habitat, but still have the potential for some effect due to the 1 Class I stream crossing.

Road Decommissioning

Alternatives 2, 3, 4, and 5 would decommission 31.3 miles non-system roads in the project area as part of the post-sale road management plan.

The roads identified for decommissioning are overgrown and naturally decommissioned. Naturally decommissioned roads would not require actions beyond removing the road sign and removing the road from the transportation system. There are no direct effects to fish and fish populations from road decommissioning. Decommissioning roads may include some of the following, installation of erosion control devices, subsoiling to reduce soil compaction, seeding, and blocking or camouflaging roads to discourage future use.

There is no difference in the direct effects to fish habitat or fish populations with the implementation of Alternative 2, 3, 4 and 5 in regard to road decommissioning.

Wolf Creek Culvert Replacement

Replacing the culvert on road 431680 that crosses Wolf Creek is proposed in Alternatives 2, 3, 4 and 5. Wolf Creek is a Class I fishbearing stream with ESA listed bull trout and redband rainbow trout. The existing culvert is inadequate for fish passage. Culvert replacement would have overall beneficial effects to fish passage and improve access for fish to upstream habitat, however there would be a short term increase in sediment and turbidity during and after instream work associated with removing and installing the new culvert. There would be a short term direct effect to water quality. The site would be dewatered at the time of construction to decrease effects to fish and water quality during in-water work. When the site is rewatered initially, sediment delivery may occur having short term effects on downstream fish and habitat. See discussion under water quality above regarding culvert installation and sediment. This culvert replacement would have an overall indirect beneficial effect to fish habitat and fish populations by improving passage to 5.2 miles of upstream habitat. There is no difference in effects between action alternatives since every alternative proposes culvert replacement on Wolf Creek.

This culvert will be replaced during the instream work window July 1-August 31 specified in Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources (2008) for Wolf Creek.

North Fork Anthony Creek Bridge Replacement

The 7312 road is a primary haul route for the East Face project area. Due to weight limitations which will not support log haul on the bridge on the 7312 road over the North Fork of Anthony Creek, the old bridge would be physically removed and a new bridge would be installed. Removal of the existing bridge and installation of the new bridge could have short term direct effects on fish habitat or populations if any equipment enters the channel or excavator work is necessary to build slopes and abutments. North Fork Anthony Creek is a Class I fishbearing stream with ESA listed Bull Trout, redband and brook trout. Effects would be the same in Alternatives 2-5.

Indirect Effects to Fish Habitat and Fish Populations

ALTERNATIVE 1 - NO ACTION

With the non-treatment of stands and fuels treatments, fuel conditions in stands, both fuel loadings and accumulation, will be excessive and the likelihood of a high intensity fire occurring is high. Fires have the potential to damage adjacent stands and RHCAs reducing the amount of large wood to streams needed for habitat formation, defoliate trees leading to increases in stream temperature, and could increase sediment yield to streams.

With the No Action Alternative, pre-commercial thinning would not occur and stands would remain overstocked. If left untreated, overstocked stands and RHCAs would stagnate, and tree diameters would remain in lower size classes (an average of less than eight inches dbh) until a disturbance occurs such as fire, insect infestation or disease.

An increase in sediment yield to streams resulting from wildfire can have potential negative effects to the growth and survival of salmonids. Increased concentrations of sediments and increased sedimentation rates can negatively affect spawning habitat, rearing habitat, overwintering habitat, and cause lethal effects to salmonids through increased egg mortality, reduced egg hatch, a reduction in the successful emergence of larvae (fry), and sediment induced death of juvenile and adult fish (Anderson, 1996).

Intense fires and related events have killed fish (Bozek and Young 1994) and even caused local extinctions (Propst et al. 1992, Rinne 1996). Large and intense fires could threaten populations of sensitive salmonids such as bull trout, Chinook salmon, steelhead, and others that are depressed from other causes (Rieman et al. 1995). The magnitude and intensity of recent fires heighten concerns regarding forest/ecosystem health and the apparent threat to sensitive species. Effects from forest fires in three study watersheds in the Boise National Forest during 1992 and 1994 included increased surface erosion and large pulses of fine sediment throughout systems following the first year of the event (Rieman et al. 1995). In many cases pools were virtually filled with new material, although pools in higher gradient channels often remained relatively free of sediment. In reaches with high intensity burn effects, shading from riparian cover was virtually eliminated. Woody debris in stream channels was often burned as well.

High intensity fire within and adjacent to RHCAs has the potential to reduce the long term recruitment of large wood to stream channels needed for the formation of fish habitat. The pulse of snags, logs, and coarse wood generated by a stand replacement fire is the recovering forest ecosystem's sole source of coarse wood until the new stand begins to generate snags and logs of comparable size and heartwood content, which generally takes 150 to 200 years in some forest types (Maser et al. 1988, Franklin et al. 2002, Harmon et al. 2004). Fire effects in low order streams are likely to have consequences for the riparian environment throughout the downstream system. The consumption of woody debris by fires in low order streams may deprive downstream reaches of this important ecological asset (Gregory et al.

2003, Gurnell et al. 2005, Pettit and Naiman 2005, Latteral and Naiman 2007). Excessive heat from fires has the potential to cause soil sterility, thereby reducing future regeneration success. Severe site conditions can slow natural regeneration of coniferous trees following a stand replacement burn (Noss et al. 2006).

ALTERNATIVES 2, 3, 4 and 5

The primary benefit to fish habitat and fish populations is the long term maintenance/enhancement of large wood recruitment to stream channels needed for structure for the formation of fish habitat, sediment retention, riparian function, and reduced risk of a high intensity wildfire in RHCAs that could increase sediment yield to fishbearing streams as well as defoliate trees leading to an increase in stream temperatures.

Sediment delivery following forest operations and prescribed fire with forested buffers are a magnitude or more lower than following wildfire, and the increased number of disturbances from active forest management result in lower long term average sediment delivery rates than would occur following less frequent wildfire disturbances (Elliot and Robichaud 2001).

Precommercial thinning would reduce stocking densities in overstocked stands to reduce risk of disease and insect infestation leaving the healthiest and most vigorous trees that meet species and stocking requirements. This would result in larger trees with fuller crowns in the RHCA for stream shade and recruitment to stream channels and hillslopes for sediment retention and channel structure. In addition, there would be a decreased risk of insect and disease infestation in adjacent stands, including those portions of stands in the RHCA, which could contribute to higher fire intensities than those that would have occurred historically leading to a long term reduction of a large wood recruitment and potential increase in sediment yield to fishbearing streams.

Silvicultural systems can improve the overall vigor of some stream ecosytems and provide a long term supply of forest structural components for streams and riparian forests (Swanson and Berg 1991). Thinning stands adjacent to streams allows for the improvement of stand vigor without deleterious impact to aquatic production. Increased growth of selected trees to be retained improves future sources of large wood. Thinning early increases diameter growth and concentrates volume growth on fewer stems (Berg 1995). Rentmeester (2004) conducted a thinning study focused on the production of snags as the primary recruitment mechanism along mainstem stream channels. Results indicate that silvicultural thinning resulted in increased diameter growth within residual trees. Faster diameter growth meant that trees were larger when they died and therefore the number of snags above the target diameter was greater. The abundance of large diameter snags increased by 20-74% under thinning scenarios in comparison to “no touch” silviculture.

Commercial Harvest

Commercial removal includes HFU, HIM, HPR, HPO, HSA, HSH, and HTH units. Table 23 describes the commercial treatment acres by alternative. Commercial harvest would be completed using ground based equipment, skyline yarding and helicopter. All commercial harvest units adjacent to fish bearing streams would have RHCA widths implemented as no activity stream buffers. RHCA widths would prevent indirect effects to fish habitat and fish populations.

There is no difference in the indirect effects to fish habitat and fish populations between Alternative 2, 3, 4, and 5 in regard to commercial harvest.

Fire Fuels Treatment (FFU) Outside of RHCAs

FFU units are mechanical treatment units and all activities would occur outside of INFISH no activity stream buffers which would prevent indirect effects to fish habitat and fish populations. See Table 71 for acres of FFU by subwatershed for Alternative 4.

There is no difference in the indirect effects to fish populations and fish habitat between Alternative 2-5 since 2, 3, and 5 have no FFU units and all units in Alternative 4 will treat only outside of RHCA buffers.

Hand Fuel Reduction (WFH) Treatments Within RHCAs

Alternative 2 and 4 propose 753 acres of fuels reduction work by hand in RHCA's, Alternative 3 proposes 612 acres and Alternative 5 proposes 747 acres, see Table 73 for acres proposed by subwatershed in each alternative. A minimum 50 foot no activity stream buffer on fishbearing streams would prevent indirect effects to fish and fish habitat. Hand treatment within RHCAs would not result in sediment yield to streams, and would not alter stream temperatures since no overstory is being removed.

There is no difference in the indirect effects to fish habitat and fish populations between Alternative 2, 3, 4, and 5 in regard to fuels reduction handwork within RHCAs because minimum no activity stream buffers on fishbearing streams would be implemented.

Precommercial Thinning

Precommercial Thinning Outside of RHCAs

Precommercial thinning outside of RHCAs (Table 4) includes mechanical treatment such as the use of a slashbuster and mechanical grapple piling of slash. Since precommercial thinning outside of RHCAs includes mechanical treatment, INFISH RHCAs will be implemented as no activity stream buffers and will prevent indirect effects indirect effects to fish habitat and fish populations. Class I fishbearing streams would receive 300 feet RHCA buffers.

There is no difference in the indirect effects to fish habitat and fish populations between Alternative 2, 3, 4 and 5 in regard to precommercial thinning outside of RHCAs.

Precommercial Thinning Within RHCAs

Alternative 2 and 4 propose 238 acres of precommercial thinning (PCT units) within RHCAs. Alternative 3 proposes 225 acres of PCT within RHCAs; Alternative 5 proposes 45 acres of PCT within RHCAs. A minimum 50 foot no activity stream buffer on fishbearing streams would prevent indirect effects to fish and fish habitat, and is based on the riparian microclimate. Precommercial hand thinning treatment within RHCAs is similar to hand fuels reduction work in RHCAs, and indirect effects to water quality and stream temperature are the same. See indirect effects to water quality for precommercial thinning treatments within RHCAs for analysis of effects. Hand treatment within RHCAs would not result in sediment yield to streams, and would not increase stream temperatures.

There is no difference in the indirect effects to fish habitat and fish populations between Alternative 2, 3, 4 and 5 due to the implementation of minimum no activity buffers in all action alternatives.

Prescribed Fire

Prescribed burning would occur when weather and fuel conditions are appropriate to meet the objectives and prescription. Prescribed burning would be accomplished within a 10 year period depending on environmental conditions needed to meet burning prescriptions. There would be no direct ignition within RHCAs, but fire would be allowed to back into RHCAs.

Because no direct ignition would be allowed within RHCAs no indirect effects to fish habitat or fish populations are expected with the implementation of Alternatives 2, 3, 4, and 5. The use of prescribed fire would not increase stream temperatures. The fire intensity from a backing fire is expected to be low in riparian areas, having little effect on riparian vegetation or the conifer overstory. There is no difference in the indirect effects to fish habitat and fish populations between Alternative 2, 3, 4, and 5 as a result of prescribed fire.

Temporary Roads

Table 76 shows the miles of temporary roads in RHCA buffers by alternative and the number of stream crossings (table 74) where culverts would be installed and removed.

Alternatives 2, 4, and 5 propose the use of temporary roads and all include miles within RHCA buffers. Alternative 2 proposes 2.01 miles of temporary road within RHCA buffers with 13 stream crossings and Alternative 5 proposes 2.46 miles of temporary road with 20 stream crossings. All of these stream crossings would be installed for project use and removed after project use. Alternative 2 and 5 propose use of temporary road T-26, which crosses one Class I fishbearing stream over East Fork Indian Creek. There is currently a culvert in place, which would be removed after project activities.

Alternatives 2 and Alternative 5 would have the greatest potential for indirect effects on fish populations and fish habitat due to crossing a Class I stream and removing a structure on a Class I stream, which would cause short term sedimentation. These alternatives have over 2 miles of temporary road within RHCA buffers adjacent to fish streams (T-24 and T-25) and in draw bottom areas. Alternative 3 would have no indirect effect on fish populations or fish habitat and Alternative 4 would have minimal indirect effects since it does not propose to use roads T-24, T-25 and T-26, which are adjacent to Class I fishbearing streams and cross a Class I fishbearing stream. The temporary roads that have highest risk to fish populations and habitat due to their proximity to fish habitat that are proposed to be used in Alternatives 2 and 5 are T-24, T-25, T-26, T-22, and T-07. These are existing wheel tracks and therefore need less construction then the new temporary roads since the road bed already exists. These roads would be properly obliterated after completion of harvest activities in Alternatives 2 and 5, eliminating potential for future motor vehicle use and impacts fish and fish habitat in these areas. Under Alternatives 3 and 4, they would remain in present condition and could receive unmanaged vehicle use.

Alternatives 2 and 5 pose the most risk to water quality due to the over 2 miles of temporary road in RHCA buffers and adjacent to streams and the use of roads T-24, T-25, T-26, T-22 and T-07 as discussed above. Alternatives 2 and 5 would potentially have more indirect effect to water quality due to the locations of these roads and the 13 and 20 stream crossings that would receive additional sediment associated with erosion from opening roads, road maintenance, and hauling operations. It is important to note with these roads of concern that the road beds already exist as wheel tracks on the ground and some roads that are not vegetated in or blocked with berms may currently receive unmanaged motor vehicle use. In Alternatives 2 and 5 these roads would be properly obliterated after completion of the harvest activities, eliminating potential for future motor vehicle use and impacts in these areas.

The T-24 road is in the valley bottom and is in very close proximity to Class I bull trout stream for approximately 0.5 miles. The road is within 15-20 feet of Class I habitat until it splits with the T-25 and the T-25 is immediately adjacent to Class I habitat for another .25 miles. Temporary road T-26 crosses East Fork of Indian Creek, Class I habitat and is in the buffer of Class I crossing for 0.2 miles. Due to the proximity of this road to fish bearing habitat and Class III habitat immediately upstream of Class I habitat, using this road for hauling would cause a continued source of sediment while it is used to fishbearing Indian Creek and the east fork of Indian Creek. Temporary road T-22 along with T-20 and T-21 crosses Class III perennial streams (tributaries to Indian Creek) four times. The only crossing structure on this road is an old log culvert at the crossing as the road enters unit 104 and it plugged and collapsing and is causing water to run down the road. This structure will need to be replaced. If it plugged and blew out it would cause sedimentation to bull trout habitat below.

All temporary roads would be built, used, and restored during the dry season and during the same season of use. After use, temporary roads will be subsoiled where appropriate, returned to original contours where needed and wood debris scattered across the footprint of the temporary road where debris is available. All stream crossing structures would be removed from the road prism and drainage across the road prism would be addressed to restore stream network connectivity.

Alternatives 2 and 5 would have the greatest potential for short term indirect effects to fish populations and fish habitat due to crossing a Class I stream, overall number of stream crossings, and proximity of roads proposed for use and haul to fish habitat and within RHCA buffers. Alternative 3 would have no indirect effect on fish populations and fish habitat and Alternative 4 would have the least amount of indirect effect since it does not propose use of these temporary roads of concern discussed above; however, Alternatives 2 and 5 would properly obliterate these wheel tracks, which would eliminate motor vehicle use in the future.

Closed Roads Used For Administrative Purposes

As described under the water quality indirect effects for closed roads to be opened for administrative use, the action alternatives propose opening 38.6 to 122.7 miles of roads with numerous stream crossings.

There are miles of closed drawbottom roads which would be opened for project purposes in all Alternatives including 4315930 and 4300330. These roads are proposed to be used in Alternatives 2 and 3, 4315930 is also proposed to be used in Alternative 4 and 4300330 is proposed to be used in Alternative 5. Opening roads in these locations and using them for project activities and hauling increases indirect effects to fish and fish habitat due to the potential to increase sediment delivery to stream channels compared to utilizing roads to access units that are located in uplands and outside of RHCAs.

Maintenance of closed roads may be required for project use. Most maintenance activities on closed roads would not result in an adverse effect to fish habitat or fish populations. Maintenance includes brushing, spot rocking, blading and shaping of the road surface, cross drain culvert cleaning, and limited ditch cleaning. A culvert on road 7312160 on a perennial Class III non-fish bearing stream was removed and would need to be installed in Alternatives 2 and 5 since both of those alternatives propose using that road. This culvert installation is less than .25 miles upstream of the extent of bull trout habitat. It is unknown how many other culverts on closed roads will need to be replaced or installed to open closed roads for project access and use. Any culvert installation on Class I and III (perennial streams) will have direct effects on water quality.

At all other stream crossing sites on closed roads road maintenance activities would result in a non-measurable amount of sediment reaching fishbearing streams due to distance to occupied habitat, limited maintenance proposed, and use of roads during dry or frozen conditions.

Sedimentation to stream channels above existing levels is expected, however roads would be used only under dry and frozen conditions and established vegetation on the road margins, sides of the road prism, and in ditches would be retained to filter and trap sediment. These mitigation measures are expected to limit sediment input into streams form project use and hauling.

Alternatives 2 and 5 have more stream crossings on closed roads opened for project use including Class I fishbearing streams, and therefore these alternatives have a greater potential for sediment yield to fishbearing streams than Alternatives 3 and 4. Indirect effects to fish and fish habitat would occur during the time the roads are reconstructed, maintained, opened with traffic associated with project activities and haul and depending on the amount of sediment input could last until rain or snowmelt run off flushes it out. The greater the amount of traffic on the roads for project activities, the greater the likely hood for sediment to enter streams from normal road surface erosion. Because the majority of roads will be re-closed after project activities, the potential for sediment input to stream channels at stream crossings is limited to the amount of time the road is opened and driven for project activities and haul.

Road Decommissioning

Alternatives 2, 3, 4, and 5 propose the decommissioning of 31.3 miles of road as part of the Post Sale Road Management Plan. These roads would be decommissioned, returned to resource production and removed from the road system.

Some of the roads identified for decommissioning are overgrown and already naturally decommissioned while others would need to be physically decommissioned. Naturally decommissioned roads would not require actions beyond removing the road sign and removing the road from the transportation system. Road decommissioning activities would take place when roads are dry. There are no indirect effetcs to fish and fish populations from road decommissioning. Decommissioning these roads would have an overall beneficial indirect effect to fish habitat and populations by restoring run off patterns and stream connectivity.

Summary of Effects to Fish Habitat and Populations from Action Alternatives

- Direct effects to fish habitat and fish populations are associated with in water work in Class I streams on North Fork Anthony Creek 7312 bridge replacement and Wolf Creek culvert replacement on 7316800. Effects are the same in Alternatives 2, 3, 4, and 5. These effects will be short in duration occurring for the amount of time equipment is in the channel or when the site is rewatered after equipment has worked at the dewatered site and sediment pulse is flushed downstream.
- For FFU activities where mechanical treatment would occur, RHCA buffer widths would be implemented as no activity stream buffers. These will prevent direct and indirect effects to fish and fish habitat.
- Alternatives 2 and 5 propose using T-26 temporary road. This road has an existing log culvert on a Class I ESA listed bull trout stream. This log culvert removed after project activity access is no longer needed. Removing the existing culvert could have short term direct effects on individual fish and fish habitat.
- Hand treatment within RHCAs combined with minimum no activity stream buffers would prevent direct and indirect effects to fish and fish habitat.
- No activity stream buffers for handwork proposed within RHCAs along fishbearing streams are based on the riparian microclimate.
- There would be no direct ignition of prescribed fire within RHCAs.
- All alternatives except Alternative 3 propose new and existing temporary roads within RHCAs, which could cause direct and indirect effects to water quality.
- In all alternatives there is the potential for sediment to reach fishbearing streams due to the location of reconstruction of roads in RHCA buffers, road miles traversing RHCA buffers, number of stream crossings on closed roads and number of fishbearing stream crossings in Alternatives 2 and 5.

- All Alternatives propose replacing the culvert on Wolf Creek, road 431680, which would have short term direct effects on fish from increase in sediment delivery during in water work, but would have an overall beneficial effect by improving fish passage to 5.2 miles of upstream habitat.

Indirect Benefits to Fish and Fish Habitat

- Primary benefits to fish habitat and fish populations from stand treatment, fuels treatment, and precommercial thinning is the long term maintenance/enhancement (> 20 years) of large wood recruitment to stream channels, and reduced risk of a high intensity wildfire in RHCAs that could increase sediment yield to fishbearing streams as well as defoliate trees leading to an increase in stream temperatures.
- The culvert replacement on road 7316800 Wolf Creek would improve fish passage to 5.2 miles of habitat upstream of crossing.
- Decommissioning 31.3 miles of roads would improve stream connectivity and hydrologic function having an overall benefit to fish and fish habitat and potentially decreasing sediment input to streams at stream crossings.
- Alternatives 2 and 5 would remove an existing log culvert on a Class I stream on T-26. The culvert would be permanently removed after project use, this would have a long term beneficial effects to fish passage and connectivity to upstream habitat.

Cumulative Effects to Fish Habitat and Fish Populations

Potential cumulative effects are analyzed by considering the proposed activities in the context of present and reasonably foreseeable future actions. Reasonably foreseeable future actions are defined as within the next 5 years. Appendix D summarizes the present and reasonably foreseeable management activities that will occur in the cumulative effects analysis area and the determination of cumulative effects.

The logical area for cumulative effects to occur would be in the Middle North Powder, Upper Anthony Creek, Lower Anthony Creek, Upper Wolf Creek, Upper Ladd Creek, and Upper Beaver Creek Subwatersheds. This is where the majority of the East Face project activities are located and where cumulative effects could occur.

ALTERNATIVE 1 – NO ACTION

The potential cumulative effect to the subwatershed from the non-treatment of fuels and stands is an increased risk of high intensity fire that could potentially increase sediment yield to fishbearing streams, decrease stream shade, and reduce future recruitment of large wood to stream channels and RHCAs.

ALTERNATIVES 2, 3, 4 and 5

Project activities may contribute to cumulative effects since some short term sediment delivery above normal rates for the watershed is expected in Class I streams in the project area from road related activities in East Face alternatives. Potential cumulative effects to fisheries and fish habitat would be the same as those described under the water quality section above.

C. Aquatic Management Indicator Species Analysis

Introduction

The Wallowa-Whitman National Forest Land and Resource Management Plan identifies two fish species as Management Indicator Species (MIS). These include the redband /rainbow trout and steelhead (USDA

1990). These species were selected as they were considered to be good indicators of the maintenance and quality of instream habitats. These habitats were identified as high quality water and fishery habitat.

The NFMA regulations require that "fish and wildlife habitat be managed to maintain viable populations of existing …species in the planning area." To ensure that these viable populations are maintained, the Pacific Northwest Region of the Forest Service has identified management requirements for a number species within the region. These Management Indicator Species are emphasized either because of their status under ESA or because their populations can be used as an indicator of the health of a specific type of habitat (USDA 1990).

Riparian ecosystems occur at the margins of standing and flowing water, including intermittent stream channels, ephemeral ponds, and wetlands. The aquatic MIS were selected to indicate healthy stream and riparian ecosystems across the landscape. Attributes of a healthy aquatic ecosystem includes: cold and clean water; clean channel substrates; stable streambanks; healthy streamside vegetation; complex channel habitat created by large wood, cobbles, boulders, streamside vegetation, and undercut banks; deep pools; and waterways free of barriers. Healthy riparian areas maintain adequate temperature regulation, nutrient cycles, natural erosion rates, and provide for instream wood recruitment.

The fish bearing streams or portions of fish bearing streams in the project area that have MIS species include:

Antone Creek
Anthony Creek
Indian Creek
North Fork of Anthony Creek
Dutch Creek
Wolf Creek
North Fork of Wolf Creek
Third Creek
East Fork of Clear Creek
West Fork of Clear Creek
Ladd Creek
Shaw Creek
Upper Beaver Creek
Tributaries to Upper Beaver Creek
North Powder River

Existing Condition

Habitat for MIS species, rainbow trout and redband trout, exists within the project area and is included in the analysis area. Table 79 below describes the MIS, the habitat they represent, and whether they are present in the project analysis area.

Table 79 - MIS and habitat description for the East Face project area

MIS	Habitat Description	Habitat Present in Analysis Area	Species Present in Analysis Area
Rainbow Trout/ Redband Trout	Water quality/ Fish Habitat	Yes	Yes
Steelhead		No	No

Methods used to document fish distribution include field presence/absence surveys and aquatic inventory surveys.

Redband/Rainbow Trout

Redband trout are sensitive to changes in water quality and habitat. Adult redband trout are generally associated with pool habitat, although other life stages require a wide array of habitats for rearing, hiding, feeding and resting. Pool habitat is important refugia during low water periods. An increase in sediment in the stream channel lowers spawning success and reduces the quality and quantity of pool habitat. Other important habitat features include healthy riparian vegetation, undercut banks and large wood debris. The Wallowa-Whitman National Forest is utilizing this fish/habitat relationship to provide the basis for assessment of redband trout populations for the purposes of MIS assessment.

In the absence of redband trout population trend data, the Wallowa-Whitman National Forest has measured key habitat variables, and then assessed changes expected to occur as a result of project activities. This MIS analysis assumes that activities that maintain and improve aquatic/riparian habitat will provide for resident fish population viability on Wallowa-Whitman National Forest lands.

Habitat Condition – The Wallowa-Whitman National Forest has completed Forest Service Region 6 Stream Surveys in the majority of fishbearing streams in the East Face Project area. The stream survey protocol (based on the Hankin and Reeves survey methodology) guides collection of field data for stream channels, riparian vegetation, and fish presence. Data collected from these surveys are then rated using habitat indicator benchmarks developed by the National Marine Fisheries Service (NMFS) and United States Fish and Wildlife Service (USFWS) (USDA, USDC, and USDI 2004), and compared to Forest Plan Riparian Management Objectives (RMOs). The following summarizes the existing conditions within East Face project subwatersheds.

Middle North Powder Subwatershed - Antone Creek – Habitat conditions in Antone Creek are good. There are higher than desirable road densities in the subwatershed and low number of full channel spanning pools. Three culverts on the 7300 road are partial barriers to the upstream migration of fish. Percentage of stable streambanks and number of pieces of large wood meet RMO values. Maximum stream temperature in Atone Creek is thought to meet RMOs based on spot stream temperatures obtained during stream survey.

Upper Anthony Creek and Lower Anthony Creek Subwatershed - Anthony Creek - Habitat conditions in Anthony Creek are fair to good. There are higher than desirable road densities in the subwatershed, and low number of full channel spanning pools. There are lower than desirable number of pieces of large wood that may be attributed to the Anthony Burn forest fire that reduced recruitment of large wood to the stream channel. There is a high percentage of stable streambanks. Riparian zone vegetation is well developed and in good condition. There are two diversion structures that can be complete barriers during irrigation season. These are both located in the Lower Anthony subwatershed.

Indian Creek - Habitat conditions in Indian Creek are rated as fair to good. There are higher than desirable road densities in the subwatershed, and low number of full channel spanning pools. There is a high percentage of stable streambanks, and number of pieces of large wood meets and exceeds the RMO value. Riparian zone vegetation is in good condition. There are two culverts that are compete barriers to the upstream migration of fish.

North Fork Anthony Creek - Habitat conditions in the North Fork of Anthony Creek is rated as good. There are higher than desirable road densities in the subwatershed, and low number of full channel spanning pools. There is a high percentage of stable streambanks. The number of pieces of large wood is slightly less than the RMO value of >20 pieces. Riparian zone vegetation is in good condition. There are no artificial barriers.

Dutch Creek - Habitat conditions in Bottle Creek are rated as poor to fair. There are higher than desirable road densities in the subwatershed, and slightly less than desirable amount of large wood. Maximum stream temperature in Dutch Creek is thought to meet RMOs based on spot stream temperatures obtained during stream survey. The number of pools per mile exceeds the RMO value of >

96 pools per mile. Habitat conditions in the approximate lower third of the fish bearing portion of Dutch Creek is in good condition. Above this point, the Carnes irrigation ditch bisects Dutch Creek. During irrigation season this ditch becomes a complete barrier to fish and a section of stream becomes dewatered. The approximate upper third of the fishbearing portion of Dutch Creek has a road crossing with a culvert. Upstream of the road crossing a draw bottom road exists along Dutch Creek imping upon the stream channel and riparian zone.

Upper Wolf Creek Subwatershed - Wolf Creek - Habitat conditions in Wolf Creek are good. The subwatershed does have a high road density, but the majority of roads in the subwatershed are closed. The maximum stream temperatures in Wolf Creek exceeds the temperature standard by an approximate six degrees Fahrenheit. There is a lower than desirable number of full channel spanning pools. Streambank stability is excellent with 96% stable streambanks. There is a high amount of large wood, and exceeds the RMO value. Riparian zone vegetation is well developed and in condition. There is one culvert that is a barrier to fish. This culvert is planned for removal or replacement under the East Face Project.

North Fork of Wolf Creek - Habitat conditions in the North Fork of Wolf Creek are good. The subwatershed does have a high road density, but the majority of roads in the subwatershed are closed. The maximum stream temperature in the North Fork of Wolf Creek exceeds the state temperature standard which is for bull trout. However, there are no bull trout in the North Fork of Wolf Creek. There is a lower than desirable number of full channel spanning pools. There is a high percentage of stable streambanks, and adequate amounts of large wood. Riparian zone vegetation is in good condition. There are no artificial barriers in the North Fork of Wolf Creek.

East Fork of Clear Creek - Habitat conditions in the East Fork of Clear Creek are good. The subwatershed does have a high road density, but the majority of roads in the subwatershed are closed. The number of pools per mile meets the RMO value, there is a high percentage of stable streambanks, and the numerous pieces of large wood exceed the RMO value. Riparian zone vegetation is in good condition. There is one culvert that is a partial barrier to the upstream migration of fish.

West Fork of Clear Creek - Habitat conditions in the West Fork of Clear Creek are good. Maximum summer stream temperatures meet the state of Oregon temperature standard. There is a high percentage of stable streambanks, and number of pieces of large wood exceeds the RMO value. Riparian vegetation is well developed and is in good condition. There are no barriers to fish migration.

Upper Beaver Creek Subwatershed - Upper Beaver Creek - Habitat conditions in Upper Beaver Creek are fair. There are higher than desirable road densities in the subwatershed. Maximum summer stream temperatures likely exceed the state water quality standard. There is a lower than desirable number of full channel spanning pools. There are a less than desirable number of pieces of large wood, and may be due to a series of meadows in Upper Beaver Creek that lack streamside conifers. Riparian zone vegetation is in good condition. There is one culvert that is a complete barrier to upstream fish migration. There is an approximate 1.1 miles upstream of this culvert. Both redband trout and brook trout inhabit Upper Beaver Creek.

The amount of occupied MIS habitat for redband trout on the Wallowa-Whitman National Forest is approximately 1,310 miles (Table 80). Based on GIS analysis, the amount of MIS habitat for redband trout in the project area represents a fraction of the overall miles of redband trout habitat for the entire forest.

Table 80 - MIS distribution in the project area in relation to the Wallowa-Whitman National Forest.

MIS	Forest Distribution (mi)	MIS in Analysis Area (mi)	Proportion of MIS habitat in Project Area out of total on Forest
Rainbow Trout/ Redband Trout	1,310	33.1	2.5%

Effects of Implementation

The only direct effects to MIS fish species or habitat from the implementation of the East Face Project is the culvert replacement on Wolf Creek on the 4316800 road and the replacement of the 7312 bridge that crosses North Fork Anthony Creek, the removal of the log culvert on T-26, and any other culvert replacements on closed roads that will be opened for administrative use that cross Class I streams. All other activities are away from fishbearing streams. No other activities associated with the East Face Project are proposed within fishbearing streams in the project area. Implementation of Standards and Guidelines in the Forest Plan as amended by Pac Fish (USDA/USDI 1994) and the East Face Project Design will avoid negative indirect effects to MIS fish species. MIS life stages present in the project area include juvenile, adult, and eggs. See Analysis of Effects on Fisheries and Watershed Resources for direct and indirect effects to fish and fish habitat.

Reduced sediment delivery improves important aquatic elements such as cleaner water, higher quality substrates for spawning and rearing habitat, and less pool infilling. Thinning densely stocked Riparian Reserve stands improves vegetation conditions, which leads to increased large wood recruitment and creates more fire resilient stands along streams. The cumulative effects are within the scope of anticipated effects to aquatic resources determined in the Wallowa-Whitman National Forest Land and Resource Management Plan (USDA 1990). For more information on cumulative effects for the Sandbox Project, see cumulative effects analysis in this document (Section 7).

Improved Conditions

The East Face Project will improve habitat conditions for the aquatic MIS in the project area through fuels reduction and thinning. Anthropogenic fine sediment delivery in the project area could decrease with project implementation as a result of road decommissioning, and properly closing temporary roads. In the long-term, there would be a reduction in artificially induced sediment entering the stream system, benefiting aquatic MIS and their habitat. In addition the culvert replacement on Wolf Creek on road 4316800 would improve fish passage to 5.2 miles of upstream habitat. Therefore, the project will not contribute to a negative trend in viability on the Wallowa-Whitman National Forest for these species.

Findings - Water Quality Compliance Statement, Floodplains and Wetlands Executive Orders

Project Effects on Riparian Management Objectives

Landscape-scale interim RMOs describing good habitat for anadromous fish were developed using stream inventory data for pool frequency, large woody debris, bank stability, and width to depth ratio. State water quality standards were used to define favorable water temperatures. All of the described features may not occur in a specific segment of stream within a watershed, but all generally should occur at the watershed scale for stream systems of moderate to large size (3rd to 7th order).

The East Face project will not immediately affect any of the RMOs with the implementation of Alternatives 2-5. However, in the long term (>20 years), this project could increase large woody debris in stream channels through pre-commercial thinning and by reducing the risk of high intensity fires. An increase in large wood could lead to an increase in pool frequency by providing a long term supply of large wood for stream channel structure. Precommercial thinning will increase stream shade by producing larger trees with fuller crowns.

Climate Change

A study conducted by Miles et al. (2000) within the Columbia River Basin, which includes the Snake River drainage, indicates that the consequence of climate change is higher flows during the winter and spring, and lower flows during the summer and fall. The tendency towards more precipitation and warmer temperatures during the winter implies substantially more rain, less snowpack accumulation, and therefore increased wintertime runoff. The decrease in snowpack accumulation, combined with lower summertime temperatures and evapotranspiration lead to decreased summertime flows. The timing of flows is also altered. Peak spring flows tend to begin earlier compared to current runoff patterns.

The effects to Columbia River streamflow from simulated changes in climate are generally towards higher winter streamflow, reduced winter snow accumulation, and reduced spring and summer streamflow (Hamlet and Lettenmaier, 1999).

Compliance Statement

The East Face Project will not degrade water quality. Planning and application of BMPs will maintain or improve water quality. This includes monitoring of BMPs and effectiveness. None of the action alternatives will have an effect on stream temperature. With the exception of maintenance of closed roads, open and closed road reconstruction, culvert installation on closed roads, and culvert installation and removal on temporary roads, ground disturbing activities in the East Face project are away from streams and would not increase sediment delivery rates within the subwatersheds. RHCA treatments (that will benefit the RHCA) are restricted pre-commercial hand thinning, fuels reduction handwork, and hand piling and burning. A limited amount of draw bottom roads would be opened for project work in each action alternative. These temporary and closed roads will be properly closed (or maintained at an ML2 open road standard) after project activities are completed. Some amount of sediment will reach stream channels as a result of implementation of Alternative 2, 3, 4, or 5 but it will be short term in nature and occur only during project activities. The East Face Project is in accordance with the Clean Water Act and complies with the Clean Water Act requirements of the 1990 Forest Plan.

Floodplains, Executive Order 11988

Executive Order (EO) 11988 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the occupation or modification of floodplains." The East Face Project is consistent with this EO because it does not propose to occupy or modify any floodplain.

Wetlands, Executive Order 11990

Executive Order (EO) 11990 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands". The East Face Project is consistent with this EO because it does not propose to destroy or modify any wetlands.

Other Wildlife

A. Snag and Log Habitat: Primary Cavity Excavators (PCEs)

Background information

More than 80 species of wildlife use snags and living trees with defects (deformed limbs or bole, decay, hollow, or trees with brooms) in the interior Columbia River basin (Bull et al. 1997). The Blue

Mountains of Oregon have 39 bird and 23 mammal species that use snags for nesting or shelter (Thomas 1979).

PCEs rely heavily on decadent trees, snags, and down woody material and can be used as an indicator species of snag habitat. These birds; common flicker (*Colaptes auratus*); Lewis' (*Melanerpes lewis*), hairy (*Picoides villosus*), downy (*Picoides pubescens*), white-headed (*Picoides albolarvatus*), black-backed (*Picoides arcticus*), three-toed (*Picoides tridactylus*), northern three-toed (*Picoides tridactylus bacatus*), and pileated (*Dryocopus pileatus*) woodpeckers; yellow-bellied (*Sphyrapicus varius*) and Williamson's sapsuckers (*Sphyrapicus thyroideus*); black-capped (*Parus atricapillus*), chestnut-backed (*Poecile rufescens*), and mountain chickadees (*Poecile gambeli*); and white-breasted (*Sitta carolinensis*), red-breasted (*Sitta Canadensis*), and pygmy (*Sitta pygmaea*) nuthatches, depend on snags for nesting and roosting, and snags and down wood for foraging. A key assumption is if habitat is provided for PCEs, then habitat requirements for secondary cavity users will be met. Suitable nest sites are often considered the limiting factor for cavity nesting bird populations. Habitat for the white-headed woodpecker, and other species such as western bluebirds, was once quite common on the east side of the Cascade Mountains, but years of fire exclusion, along with selectively harvesting large old pine trees has greatly reduced this habitat to well below historic levels.

Thinning and prescribed burning may be needed to restore habitat and increase bird numbers. In one study, white-headed woodpeckers were not observed in any untreated forest stands during 3 years of monitoring (Okanogan and Wenatchee National Forests, Cascade Lookout newsletter 2006). These same treatments are also successful in reducing the risk of high severity fire in these stands. Many PCEs, and secondary cavity nesters, feed on forest insects and play a vital role in maintaining healthy, productive forests. Large snags and trees provide more functions, for more species, for a greater period of time than smaller ones. Large woody structures are not easily or quickly replaced. Down woody material is an important component of the forest ecosystem because of its role in nutrient cycling and immobilization, soil productivity, and water retention (Johnson and O'Neil 2001). It also provides habitat for mycorrhyzal fungi, invertebrates, reptiles, amphibians, and small mammals. For these reasons emphasis should be placed on conserving or creating these structures when carrying out forest management practices. There is increasing pressure on snag and log habitat as logging safety restrictions and firewood gathering intensify.

LRMP standards

LRMP direction is to maintain snags and green tree replacement trees of ≥21 inches dbh, or whatever is the representative diameter of the overstory layer if it is <21 inches dbh, at 100% potential population levels of primary cavity excavators (U.S. Forest Service 1995). The LRMP used information from Wildlife Habitats in Managed Forests (Thomas et al. 1979; at least 2.25 snags >20 in dbh per acre) to establish minimum snag guidelines. The model Thomas et al. (1979) used to generate snag densities addressed snags for roosting and nesting, but did not consider snags for foraging, and was never scientifically validated. More recently, several studies have shown these snag densities are too low to meet the needs of many primary and secondary cavity users (Bull et al. 1997, Harrod et al. 1998, Korol et al. 2002). Consequently, the original standards for snags and down wood from Thomas et al. (1979) were replaced with the Regional Forester's Forest Plan Amendment #2 (U.S. Forest Service 1995). Bull et al. (1997) found the 2.25 snags/acre insufficient and that 4 snags/acre (2.8 are between 10-20 inches dbh and 1.2 are >20 inches dbh) is more appropriate as a minimum density required by primary and secondary cavity users for roosting, nesting, and foraging needs. Harrod et al. (1998) determined a range of historic snag densities for dry eastside forests between 5.9-14.1 snags/acre (5-12 are between 10-20 inches dbh and 0.9 to 2.1 are >20 inches dbh). Korol et al. (2002) determined that HRV for large snags (20 inches dbh) for dry eastside mixed conifer forest with a low intensity fire regime was 2.9 to 5.4 snags/acre.

Direction from the Eastside Screens requires that pre-activity levels of logs be left unless those levels exceed those shown in Table 81. Live green trees of adequate size must also be retained to provide replacements for snags and logs through time. Generally green tree replacements (GTRs) need to be retained at a rate of 25 to 45 trees per acre, depending on biophysical group. Pre-activity levels of logs should also be left unless levels exceed amounts specified in Amendment #2 (U.S. Forest Service 1995; Table 5). Larger blowdowns with intact tops and root wads are preferred to shorter sections of tree boles.

Table 81 - LRMP standards for down wood[1] (U.S. Forest Service 1995).

Stand type	Pieces/acre[1]	Piece length	Diameter small end	Linear ft/acre
Ponderosa Pine	3-6	> 6`	12``	40`
Mixed conifer	15-20	> 6`	12``	140`
Lodgepole Pine	15-20	> 8`	8``	260`

[1] The table converts to about 0.4, 1.7, and 3.3 tons/acre for ponderosa pine, mixed conifer, and lodgepole pine,

The Decayed Wood Advisor (DecAID)

Integration of the latest science is incorporated into this analysis using DecAID Advisor (version 2.2) (Mellen-McLean et al. 2012) which is an internet-based summary, synthesis, and integration (a "meta-analysis") of the best available science: published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. In addition to data showing wildlife use of dead wood, DecAID also contains data showing amounts and sizes of dead wood across the landscape based on vegetation inventory data.

Data from unharvested plots are assessed separately and these data can be used as a reference condition to approximate HRV of dead wood. There is debate among professionals on the impact fire exclusion has on stands relative to HRV of dead wood. One caveat to using these data is, "On the eastside in particular, current levels of dead wood may be elevated above historical conditions due to fire suppression and increased mortality, and may be depleted below historical levels in local areas burned by intense fire or subjected to repeated salvage and firewood cutting" (Mellen-McLean et al. 2012). Even with this caveat, the data are used in this analysis because: they are still some of the best data available to assess HRV of dead wood, even in eastside dry forests; they are the only available data showing distribution and variation in snag and down wood amounts across the landscape; the data from unharvested stands are in the range of other published data on HRV of dead wood even in the drier vegetation types. For a full discussion see HRV Dead Wood Comparison (Mellen-McLean 2011).

A distribution analysis (http://www.fs.fed.us/r6/nr/wildlife/decaid-guide/distribution-analysis-green-tree.shtml) was used to determine how close current conditions for dead wood on the landscape match reference conditions. Existing conditions for dead wood were derived by using Gradient Nearest Neighbor (GNN) data (LEMMA). GNN produces pixel-based maps with associated snags. These maps provide the direct data necessary to construct "current situation" histograms. GNN uses the same data that were used to develop the distribution histograms for DecAID.

The analysis area for the distribution analysis is larger than the project area and encompasses the Wolf Creek-Powder River and North Powder River watersheds. The larger analysis area was needed to meet the minimum analysis area size of 12,800 acres per wildlife habitat type recommended by the authors of DecAID (Mellen-McLean et al. 2012).

The distribution analysis results are then compared to the needs of woodpecker species using tolerance levels and intervals (range between 2 tolerance levels) from DecAID. A tolerance interval is similar to the more commonly used confidence interval but with a key difference: tolerance intervals are estimates of the percent of all individuals in the population that are within some specified range of values. In comparison, confidence intervals are estimates of sample means from the population of interest.

An example of use of a tolerance level is as follows. If the 50% tolerance level for snag density at pileated woodpecker nest sites in a specific wildlife habitat type is 7.8 snags/acre, the interpretation would be that 50% of nest sites used by pileated woodpeckers in that habitat have < 7.8 snags/acre and 50% of nest sites used by pileated woodpeckers have > 7.8 snags/acre.

Existing Conditions

The Eastside mixed conifer, montane mixed confier, ponderosa pine, Douglas-fir and lodgepole pine wildlife habitat types occur in the analysis area. Results of the DecAID distribution analysis are discussed below.

PPDF WHT- In the Ponderosa Pine/Douglas-fir wildlife habitat type (PPDF WHT), the landscape is near or above reference conditions for densities of large snags (>20”), and for snags >10 inches. There is less area lacking snags (0 snags/acre) than would be expected under reference conditions and more area in all other snag density classes, except for the 2-4 snag density class for large snags. Fires have burned enough of the landscape over the last decade that high densities of large snags occur on the landscape similar to what would have been expected under reference conditions. Most woodpecker species using this WHT should currently have an adequate amount of snag habitat on the landscape. The exception is those species using high densities of small snags in recent post-fire habitat (e.g., black-backed woodpecker). Large snag habitat for pileated woodpecker and Williamson’s sapsucker is rare in this wildlife habitat type both currently and with reference conditions.

EMC WHT- In the Eastside Mixed Conifer Wildlife Habitat Type (EMC WHT), the landscape is deficient in all snag density classes for large snags (>20”) compared to reference conditions except for the 0-2 density class. Snag density on the landscape still provides habitat above the 50% tolerance level for cavity-nesting birds in general. For snags >10 inches dbh, the landscape is above reference conditions in all snag density classes except the 24-36 snag/acre class.

Snag habitat for most cavity-nesting birds should not be limiting in this area with the exception of those species using high densities of small snags in recent post-fire habitat. Though snag density levels provide habitat for pileated woodpeckers and Williamson’s sapsuckers at the 50% tolerance level, habitat may be limited to more productive sites in this WHT where snag densities are expected to be higher (Bull et al. 2007, Ohmann and Waddell 2002).

The amount of the landscape in the highest density classes for snags from unharvested stands (DecAID data) may be somewhat inflated due to an excess of dense stands with smaller trees susceptible to mortality than likely occurred historically. In addition, the data used in the calculation of reference conditions are from the late 1990s when spruce budworms were active in the Blue Mountains which created high levels of tree mortality. Lack of larger snags in this watershed/analysis area is also likely due to past managememt and firewood cutting.

MMC WHT- In the Montane Mixed Conifer Wildlife Habitat Type (MMC WHT), the landscape has become deificient in large snags (>20 “) at the 4-6 snags/acre density class and above compared to the reference condition. Conversely, the landscape contains excess small snags (>10”) in the density classes 6-12 and above. This is likely due to fires that have burned in the landscape over the last decade creating areas with high densities of small snags. This portion of the landscape is providing habitat for those woodpeckers associated with post-disturbance habitats.

Concurrently, the lack of large snags in higher densities in this watershed is also likely due to past large wildfires that occurred approximately 60 years. The Anthony Lakes fire was a stand replacing fire and so the stands have yet to reach an age where large snags would be expected to be created in higher densities.

LP WHT- In the lodgepole pine wildlife habitat type the landscape is below reference condition for snags >10 inches in all density classes except for 0 snag/acre and the 0-6 snag/acre. Lodgepole pine very, very rarely grows above 20 inches and 12 inch dbh lodgepole is considered old-growth, so large trees within the lodgepole wildlife habitat type is not analyzed here. Lack of higher densities of lodgepole is most likely due to a combination of past management activities, past large fires and historic and current firewood cutting. Heavy harvest in the 1980's focused on lodgepole stands that had been infested with mountain pine beetle and these harvests removed many snags from the landscape. The Anthony Lakes burn occurred 60 years ago and reset the ages of many lodgepole stands. The stands that came in after the fire have not had enough time to reach the age where higher densities of snags would be expected. Firewood cutting in the area tends to concentrate on lodgepole snags because of their accessibility and high BTU.

Down wood- Based on field reconnaissance (summer/fall 2014), down wood in all size classes (0 - 0.25 inch, 0.25 - 1 inch, and >3 inch) is common throughout the project area and the Wolf Creek/Powder River and North Powder River watersheds, indicating the total volume of down wood exceeds LRMP standards. Within the watershed the cold upland forest types contain (< 30 tons/acre fuel loads), the dry upland forest types contain (< 20 tons/acre fuel loads), and the moist upland forest types contain (>30 tons/acre fuel loads).

Retention of downed logs is based on Amendment #2. DecAID provides estimates of percent cover of downed wood. The existing down wood data is in tons per acre. A direct conversion to percent cover tolerance levels is not possible without the length of the logs and diameter, and this data is not available. However, estimates of post project down wood based on field reconnaissance exceed LRMP standards.

Effects

Assumptions

The direct, indirect, and cumulative effects analysis area for snag and log habitat management indicator species is the Wolf Creek-Powder River and North Powder River watersheds. The larger analysis area was needed to meet the minimum analysis area size of 12,800 acres per wildlife habitat type recommended by the authors of DecAID (Mellen-McLean et al. 2012).

The duration of effects are discussed when relevant or practical to predict. The following timeframes will apply for the purpose of this analysis. These timeframes are appropriate given the scale of this analysis and the duration of effects expected from the prescribed treatments.

Short term	0 – 20 years
Mid-term	20 - 50 years
Long term	50 - 100 years

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on dead and defective habitat management indicator species.

- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement

These activities and their effects will not be discussed further in the effects to snag and log habitat indicator species sections below.

Direct/Indirect Effects – Snag and Log Habitat

ALTERNATIVE 1

This alternative retains the most snag habitat in the short-term and mid-term to the degree that snags would not be reduced for operational reasons, or consumed during prescribed burning as in the action alternatives.

Stands containing larger structure trees would continue to provide snag and down wood habitat to meet habitat requirements of primary cavity nesters at least through the short-term (15-25 years). In the absence of stand replacement fires, down wood levels would continue to increase. Stands within the analysis area that were logged in the early 1990s would begin to provide snag habitat in the long- term. Tree mortality in overstocked stands will increase fuel loadings, increasing the likelihood of stand replacement fires. This would benefit species like black-backed and hairy woodpeckers in the short term, but would reduce or eliminate habitat for pileated, white-headed, and downy woodpeckers less associated with fire.

ACTION ALTERNATIVES

Non-commercial

Project activities will not remove any snags >12 inches except when they pose a danger to personnel. Non-commercial fuels treatments are not expected to negatively affect snag densities; though in the long-term pre-commercial thinning is expected to provide larger snags, similar to commercial thinning. Snags that are lost in prescribed burns are often replaced with new snags from trees killed during the fire. Proposed fuels activities (removing small trees, retaining large trees, prescribed burning) are expected to help create habitat for PCEs using open forests with large trees in the long-term and reduce habitat for those PCEs using dense forests.

Prescribed burning creates a period of reduced “soft snag” habitat that persists into the early mid-term. This can cause wildlife species that depend on such structures, such as pileated woodpeckers, to move to other areas in search of suitable habitat, resulting in lower productivity and reduced local populations. Although burning would likely reduce the densities of snags and logs, the burn plan is designed to protect large snags. The function of snag and log habitat in the analysis area is not likely to be compromised by burning given the considerations that are built into the prescription; the lighting pattern would be designed to protect large diameter snags. Fire would also likely create new snags and logs to replace some of the small to medium diameter material that may burn. However, newly created snags and logs are usually hard and not easily excavated. Burning creates a period of reduced “soft snag” habitat that persists into the short and early mid-term. This can cause wildlife species that depend on such structures to temporarily move to other areas in search of suitable habitat, resulting in lower productivity and reduced local populations. Alternatives 2, 4 and 5 propose approximately 6,600 acres of prescribed burning. Alternative 3 proposes slightly less at 6,000 acres.

Commercial

Five different types of commercial treatments are proposed for the East Face project area that are expected to affect future recruitment of snags. Six models were run using the Forest Vegetation Simulator (FVS) looking at different treatments on different stands in the dry, moist and cold forest types to see the effects to snags comparing no treatment and treatment after 30 and 50 years (Table 82).

All commercial treatments will reduce the density of snags on the landscape in the short and the long-term (Table 82). Treatments are designed to improve the health of the stand, reducing competition, insect and disease mortality which in turn reduces snag recruitment. After 30 years a treated area has a range of 9-28 snags/acre as opposed to 16-76 snags/acre in an untreated area, and after 50 years a range of 7-35 snags/acre is found in treated areas compared to 20-70 snags/acre in untreated areas. These ranges in the treated areas still meet the minimum thresholds for primary cavity excavators and still meet forest plan standards for ecologically appropriate numbers. With treatment, snag size tends to be larger than without treatment. The average dbh of snags in treatment areas after 30 years is 11.2 inches as opposed to 8.8 inches dbh. Fifty years after treatment the average dbh in treated stands is 12 inches dbh compared to an average dbh of 10 inches in untreated stands. Treatments increase the growth rate of the remaining trees, thus increasing the amount of large trees in the mid to long-term, which will be beneficial to PCE's as large snags are limiting on the landscape in all wildlife habitat types except Ponderosa Pine/Douglas-Fir.

Each Alternative proposes different amounts of commercial treatment and non-commercial treatments (Table 83). Alternative 5 proposes the highest amount of commercial treatments, 21% of the project area. This alternative would have the highest short-term negative effect on the overall density of snags in the project area but long-term would provide the greatest positive effect on large snag recruitment. Alternative 4 proposes the least amount of commercial treatments, 6% of the project area. This Alternative would have the least short-term negative effect on the overall density of snags in the project area, but would also have the lowest positive effect on large snag recruitment. All alternatives would maintain snag levels above forest plan standards and provide habitat for PCE's at least at the 50% TL.

Table 82 - Comparison of effects of 5 different commercial treatments on snag recruitment in treated and untreated stands 30 and 50 years after treatment

Unit	PVG	Struc	RX	Existing Condition				No treatment- 30 years				Treatment- 30 years				No treatment- 50 years				Treatment- 50 years			
				#/ac	min DBH	max DBH	avg DBH	#/ac	min DBH	max DBH	Avg DBH	#/ac	Min DBH	Max DBH	avg DBH	#/ac	min DBH	max DBH	avg DBH	#/ac	min DBH	max DBH	avg DBH
1	Moist	UR	HIM	5	0.7	19.0	11.1	16	1.5	21.9	9.9	9	1.0	30	13.5	20	2.5	21.9	12.0	8	2.9	30.0	14.3
2	Moist	UR	HSH	116	1.0	25.2	5.5	76	1.0	22.6	8.6	22	1.4	25.7	11.9	60	1.0	22.6	9.2	35	1.8	25.7	7.4
3	Moist	UR	HPR	5	0.7	19.0	11.1	61	2.1	15.3	6.6	5	3.5	8.9	5.8	51	2.9	13.6	7.4	7	4.6	17.0	8.3
4	Dry	OFMS	HSA	0	0	0	0	68	0.9	28.4	7.2	22	1.0	27.7	14.0	70	1.4	32.6	7.9	19	1.9	27.6	13.5
5	Moist	UR	HTH	51	1.0	27.0	11.2	32	2.3	27.0	13.4	23	3.3	29.6	13.8	28	3.1	33.0	15.3	15	4.7	34.0	17.1
6	Dry	SE	PCT	9	2.0	26.5	6.2	51	3.3	21.1	7.1	28	2.0	21.1	8.2	40	3.3	21.1	8.5	35	6.2	31.7	10.5

Table 83 - Comparison of proposed commercial and non-commercial treatments between Alternatives. Percentage is percent of project area

Treatments	Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Commercial	Acres % Project Area	0	6,722 14%	3,879 8%	2,844 6%	10,221 21%
Non-commercial	Acres % Project Area	0	10,376 22%	9,775 20%	13,656 29%	7,815 16%
Total Commercial/ Non-Commercial	Acres % Project Area	0	17,098 36%	13,654 29%	16,500 35%	18,036 38%
Prescribed Fire	Acres % Project Area	0	6,685 14%	6,043 13%	6,643 14%	6,686 14%

Cumulative Effects on Snag and Log Habitat

The list of past, present and foreseeable actions was reviewed to determine potential effects to dead and defective wood habitat and considered the Wolf Creek Powder River and North Powder River watershed. Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF and BLM lands have been incorporated into the existing condition. Firewood cutting will continue to reduce available snags and logs, but the effect is limited to areas adjacent to open roads. Roads that are temporarily open for harvest activities will temporarily increase firewood cutting activities and snag densities in those areas will go down, though it is illegal to take snags > 21 inch dbh. Precommercial thinning activities from the Ladd Canyon TSI project (expected activities in 2015-2016) and on adjacent private lands would not directly affect current snag levels but are expected to reduce future snag densities and increase average snag diameter while still maintaining Forest Plan snag standards. Commercial and fuel reduction treatments in the Elkhorn Wildlife Area (expected activities in 2015) would also reduce snag densities but would result in larger snag diameters in the long term. Timber harvest on private inholdings is expected to continue at some level, with anticipated reductions of trees larger than 10 inches dbh and snag densities are expected to decline.

Conclusion

Current availability of snags in the project area indicate deficiencies in large snag densities within the Eastside Mixed Conifer and Montane Mixed Conifer Wildlife Habitat Types, though habitat remains for all species at the 50% tolerance level. All proposed activities are consistent with Forest Plan and BLM Resource Management Plan standards and guidelines pertaining to primary cavity excavators. Timber harvest and prescribed burning under all action alternatives have the potential to decrease snag densities, but that impact is expected to be minor within the project area and on the landscape as a whole due to snag retention requirements.

Harvest treatments will result in lower levels of green tree recruitment, but recruitment levels meet Forest Plan standards as well as exceed recommendations from more recent research (Bull 1997, Harrod 1998, Korol 2002). Stand density treatments in conifer stands are expected to enhance habitats for Lewis' woodpecker, white-headed woodpecker, northern flicker, pygmy nuthatch, white-breasted nuthatch, and Williamson's sapsucker green tree habitats. Although treatments would improve habitats for these species within the project area, the effect to habitats Forest-wide would be minor considering that the project area encompasses only 2% of the WWNF acres. Proposed tree density reduction treatments would reduce risk to insect and wildfire disturbance on up to 18,036 acres within the project area, thereby reducing the potential for future pulses of habitat suitable for Lewis', hairy, and black backed woodpeckers within a large portion of the project area, although currently habitat exists.

Alternative 5 proposes the highest amount of commercial treatments, by managing 21% of the project area. This alternative would have the highest short-term negative effect on the overall density of snags in the project area but long-term would provide the greatest positive effect on large snag recruitment. Alternative 4 proposes the least amount of commercial treatments, 6% of the project area, having the least short-term negative effect on the overall density of snags in the project area, but would also have the lowest positive effect on large snag recruitment. No alternative considered for the East Face project would affect population trends or viability for primary cavity excavator species at the Forest level.

B. Neotropical Migratory Bird Species

Background Information

A migratory bird is defined by the Migratory Bird Treaty Act of 1918 as any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle. They are a large group of species, including many hawks (*Buteo sp.*), shorebirds (*Charadriiformes*), flycatchers (*Muscicapidae sp*), vireos (*Vireonidae sp.*), swallows (*Hirundinidae sp.*), thrushes (*Turdidae sp.*), warblers (*Parulidae sp.*), and hummingbirds (*Trochilidae sp.*), with diverse habitat needs spanning nearly all successional stages of most plant community types. Nationwide declines in population trends for migratory species, especially neotropical species, have developed into an international concern. Recent analyses of local and regional bird population counts, radar migration data, and capture data from banding stations show that forest-dwelling bird species have experienced population declines in many areas of North America (Finch 1991). Habitat loss is considered the primary reason for declines. Other contributing factors include fragmentation of breeding grounds, deforestation of wintering habitat, and pesticide poisoning.

The U.S. Fish and Wildlife Service (FWS) is the lead federal agency for managing and conserving migratory birds in the United States; however under Executive Order (EO) 13186 all other federal agencies are charged with the conservation and protection of migratory birds. In response to this, the Forest Service has implemented management guidelines that require the Forest Service to address the conservation of migratory bird habitat and populations when developing, amending, or revising management plans (Executive Order 13186, 2001). To aid in this effort, the USFWS published *Birds of Conservation Concern 2008* (*BCC 2008*). The overall goal of the report is to accurately identify the migratory (and non-migratory) bird species that represent the high conservation priorities. BCC 2008 uses current conservation assessment scores from three bird conservation plans: Partners in Flight North American Landbird Conservation Plan (PIF; Rich et al. 2004), the United States Shorebird Conservation Plan (USSCP; Brown et al. 2001, USSCP 2004), and the North American Waterbird Conservation Plan (NAWCP, Kushlan et al. 2002).

Bird Conservation Regions (BCRs) are used to separate ecologically distinct regions in North American with similar bird communities, habitats, and resource management issues. Species contained within the BCC are identified for each BCR. The La Grande District and majority of the Wallowa-Whitman National Forest (WWNF) is found within BCR-10, Northern Rockies.

Existing Conditions

BCR-10 includes the Northern Rocky Mountains and outlying ranges in both the United States and Canada, and also the inter-montane Wyoming Basin and Fraser Basin. The Rockies are dominated by a variety of coniferous forest habitats. Drier areas are dominated by ponderosa pine, with Douglas-fir and lodgepole pine at higher elevations and Engelmann spruce and subalpine fir even higher. More mesic forests to the north and west are dominated by eastern larch, grand fir, western red cedar and western hemlock. Five migratory species of conservation concern have been identified as potentially occurring within the project area (Table 84). No formal surveys have been conducted specifically for any of these species within the East Face analysis area, although terrestrial birds were monitored in the Blue Mountains from 1994-2011 as part of the U.S. Forest Service Avian Monitoring Program (Huff and Brown 2006), as well as multiple annual breeding bird survey route through the La Grande and Baker districts (Sauer et al. 2011).

Table 84 - Migratory species of conservation concern identified within the East Face analysis area

Focal Species	Key Habitat Relationships		
	Vegetative	Vegetation Structure	Special Considerations
Dry Forest			
White-headed woodpecker	Ponderosa pine	Large patches of old forest with large trees and snags	
Flammulated owl	Ponderosa pine, Douglas-fir	Old forest with grassy opening and dense thickets	Thicket patches for roosting; grassy openings for foraging
Chipping sparrow	Ponderosa pine, Douglas-fir, grand fir	Open understory with regenerating pines	Non-agricultural/grazing landscape due to cowbird parasitism
Lewis' woodpecker	Ponderosa pine	Patches of burned old forest	Soft snags for excavation; pesticide spraying may reduce prey base
Moist Mixed Conifer Forest			
Vaux's swift	Grand fir, douglas-fir	Large snags	Recruitment snags (live trees) with signs of defect; proximity to riparian areas
Townsend's warbler	Grand fir, douglas-fir	Overstory canopy closure	
Varied thrush	Grand fir, douglas- fir	Structurally diverse; multi-layered	Area sensitive; avoids edges; needs dense leaf litter for foraging
MacGillivary's warbler	Douglas-fir	Dense shrub layer in forest openings and understory	Cowbird host; extensive grazing detrimental
Olive-sided flycatcher	Grand fir, ponderosa pine	Edge and openings created by fire	Patches of mix of live and dead
Subalpine Forest			
Hermit thrush	Spruce-fir	Patches of subalpine forest with multi-layered structure and dense understory shrub layer	Livestock grazing can reduce understory density; species shows lower abundance in treated stands

Dry Forests

Dry forests in relation to migratory bird species are described as coniferous forests composed exclusively of ponderosa pine or dry stands co-dominated by ponderosa and Douglas fir or grand fir (Altman 2000). Large-scale declines in open stands, especially those with large trees, have raised concern for such species as the white-headed woodpecker, flammulated owl, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker. 19% of the East Face project area consists of Dry Forests.

Moist mixed conifer Forest

Moist mixed conifer forests in relation to migratory bird species are described as consisting primarily of cool moist Douglas-fir/grand fir, cool dry Douglas-fir, western larch, hemlock, and occasional ponderosa pine. This habitat does not include sites that were historically ponderosa pine but have transitioned to mixed conifer due to fire suppression and encroachment of other conifers. Approximately 40% of the East Face project area consists of moist mixed conifer forests.

Effects

Assumptions

The direct, indirect, and cumulative effects analysis area for neotropical migratory bird species is the East Face project area.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on dead and defective habitat management indicator species.

- Roadside hazard tree removal
- Closed roads reopened for administrative access
- Road decommissioning
- Temporary road construction & Road reconstruction
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement
- Mechanical Control Lines for Burning

These activities and their effects will not be discussed further in the effects to Neotropical Bird species sections below.

Direct/Indirect Effects – Neotropical Migratory Bird Species

ALTERNATIVE 1

Current conditions would persist under Alternative 1. Activities including timber harvest, prescribed fire, and transportation activities would not occur. Stand conditions would remain denser than those estimated to have existed historically in warm and dry forest types, with elevated risk of stand replacement fire.

ACTION ALTERNATIVES

Timber harvest and prescribed burning treatments conducted during the primary nesting season present the potential for direct impacts to neotropical birds nesting in stands proposed for treatment. Potential direct effects include individual mortality or displacement from nests during treatment. The degree of impact varies by alternatives and is best correlated with the number of acres treated with Alternative 5 treating the most acres in dry and moist mixed conifer forests followed by Alternative 2, Alternative 3 and Alternative 4 respectively.

Commercial

The Partners in Flight Conservation Strategy applicable to the Blue Mountains (Altman 2000) described dry forest habitat as among the most reduced habitat types in the Interior Columbia Basin with dry OFSS reduced by 96% in the Blue Mountains. The Conservation Strategy stresses the importance of restoring open single-storied stands with large trees for conserving associated land bird species. All action alternatives would increase available OFSS habitat. Alternative 2 and Alternative 5 generate the largest benefit for species dependent upon open forest with large trees by increasing available dry OFSS by 7% across the project area. Alternative 3 would increase dry OFSS by 6% and Alternative 4 would increase dry OFSS by 4% (Table 84).

The Partners in Flight Conservation Strategy selected late-successional mixed mesic conifers a priority habitat due to substantial losses in the ecoregion as a result of past timber harvest, primarily due to substantial losses as a result of past timber harvest, primarily regeneration harvests. Treatments in Alternative 2 and Alternative 5 would reduce moist OFMS by 1% across the project area and negatively affect neotropical migrants that require high canopy closure and complex stands (Townsends warbler, varied thrush). Species that prefer shrub layer in openings and edges caused by wildfire within moist mixed conifer, like the Olive-sided flycatcher, are assumed to benefit from treatments within moist forests. However Robertson and Hutto (2007) found that commercial vegetation treatments seem to create ecological traps for olive-sided flycatchers in particular. Densities of flycatchers within created habitat increased, but nesting success was half of what was expected compared to control areas that had burned in natural wildfire. Based on this, it can be assumed that commercial treatments, while mimicking habitat for the olive-sided flycatcher, will have a negative effect on them with Alternative 2 and 5 have the greatest effect.

Conversely Alternative 2 and 5 will treat a greater amount of understory reinitiation stands, setting the condition for future moist OFMS. Alternatives 3 and 4 would not affect the percentage of OFMS found within the project area but forego opportunities to increase future OFMS by treating existing UR stands.

All Alternatives propose treatments within subalpine forests and would have a negative effect on subalpine specific species (hermit thrush). Alternatives 2, 4 and 5 would reduce cold OFMS by 1% across the project area. Though Alternative 3 proposes treatments in the subalpine forests, treatments are so limited that they would not affect the percentage of subalpine forest found within the project area.

Non-commercial

The spring prescribed burning season on the WWNF normally occurs from mid-April to the end of May. Fall prescribed burning generally occurs from October 1 through early November. The prescribed fire program has generally consisted of burning an estimated 50% of acres in the spring and 50% of acres within the fall period. Applications from April through mid-May are unlikely to impact the majority of nesting birds of concern. However, prescribed burning during and after the latter portion of May has the potential to directly impact nests and individuals, primarily young of the year. Sallabanks (no date) described the onset of ground-nesting birds as occurring after spring vegetation leaf-out and recommended completion of spring burning prior to leaf-out. Therefore, design features have been incorporated into the project that require district wildlife biologists review of prescribed burning that extends past May, as well as passive lighting and means of reducing potential for consumption of larger snags.

Prescribed fire presents both negative impacts and benefits to dry forest conditions by potentially creating and removing (consuming) snags, maintaining openings, and removing dense understory conifer thickets and developing shrub layers. Application of passive lighting near snags during prescribed burning would reduce the potential for consumption of snags. Down logs would be maintained at or above levels prescribed in the Eastside Screens. None of the treatments would remove patches of burned forest, but silviculture and prescribed fire reduce the potential for burned habitat within the project area. Duration of effects due to density reduction is expected to last 10-30 years.

For cavity nesting species, retention of snags except for safety reasons mitigate the risk of direct impact to these species.

All action alternatives propose silviculture treatments that would restore aspen where found, thereby providing localized benefits for aspen dependent species.

Table 85 – Comparison of Old Growth stand structure to HRV after proposed treatments

Structure/PVG	HRV	Existing	Alternatives				
			1	2	3	4	5
OFMS- Moist	15-20%	12%	12%	11%	12%	12%	11%
OFMS- Dry	5-15%	10%	10%	4%	5%	6%	4%
OFMS- Cold	10-25%	16%	16%	16%	16%	16%	16%
OFSS- Moist	10-20%	0.14%	0.14%	0.7%	0.14%	0.4%	0.7%

OFSS- Dry	40-60%	3%	3%	10%	9%	7%	10%
OFSS- Cold	5-20%	2%	2%	3%	2%	3%	3%

Cumulative Effects for Neotropical Bird Species

Effects of past activities including road construction, fire suppression, prescribed fire, and timber management on WWNF lands have been incorporated into the existing condition. Livestock grazing is expected to continue within the analysis area. Habitat improvements afforded by the action alternatives for chipping sparrow may also increase access of areas to livestock and brown-headed cowbirds. The potential for increase in nest parasitism is expected to be most pronounced in areas adjacent to existing cattle operations and agriculture on private lands along the southern boundary of the project area.

Timber harvest on adjacent private lands is expected to continue, with little availability of late and old forest structure and large snags anticipated. Therefore, habitat on National Forest lands will be increasingly important as habitat on private lands is reduced.

Conclusion

All action alternatives have the potential to directly impact neotropical migratory bird species (NTMBs), due to potential nest tree removal during the nesting season. The level of impact is unknown, but potential is highest for Alternatives 2 and 5, and less for Alternative 4 and 3 respectively. The no-action alternative removes direct impacts to NTMBS but maintains habitat conditions that favor high-density forest stands that may not be sustainable in the long-term. Implementation of mitigation factors reduces the potential for direct impacts to nesting land birds.

The action alternatives increase dry forest habitats by restoring single-story structure, thereby benefiting land birds associated with this habitat type. Alternatives 2 and 5 would restore the largest amount of dry forest habitat. Alternatives 3 and 4 also restore habitat, but at slightly lower amounts in comparison to Alternatives 2 and 5.

All action alternatives would decrease available moist OFMS with Alternative 2 and 5 removing the most and Alternative 3 and 4 removing less. Alternative 2 and 5 will remove 1% of moist OFMS from the project.

All action alternatives have the potential to increase nest parasitism by opening up forest stands and increasing available forage for livestock. Overall, with implementation of project design features, the project is consistent with managing dry forest habitats as well as maintaining existing mixed mesic late-successional habitat. Effects of stand treatments are expected to last 10-30 years.

Proposed, Endangered, Threatened, and Sensitive Species

A. Botanical Resources

Existing Condition - USFS

Endangered and Threatened Species:

One listed plant species (Howell's spectacular thelypody) *Thelypodium howellii* ssp. *spectabilis,* a threatened plant, and one candidate species (whitebark pine) *Pinus albicaulis* are listed for Union County.

There are no occurrences or habitat on National Forest System lands for *Thelypodium howellii ssp. Spectabilis,* a federally listed threatened plant species which may occur within Union County, Oregon.

This species is known to occur in relatively moist, alkaline meadows in or adjacent to valley bottoms. Populations occur on private and county lands near North Powder, Haines and Baker City (USFWS 2002) in Baker County.

Because there is no habitat or listed plant species in the analysis area, the project would have no effect to Howell's spectacular thelypody. The candidate species whitebark pine is discussed below.

Region 6 - Sensitive Plant Species:

The following eight sensitive plant species occur at numerous locations within the East Face project area, as indicated below:

Sensitive plant species:	Number of Sites previously locatied within the Project Area
Barbilophozia lycopodioides	2
Botrychium montanum	12
Botrychium pedunculosum	2
Campylium stellatum	1
Hydnotria michaelis	1
Pinus albicaulis	18
Tomentypnum moss	1
Utricularia minor	1

Existing Condition - BLM

The rare species databses for WA/OR BLM GeoBOB (Geographic Biotic Observations), ORBIC (Oregon Biodiversity Information Center), and the Forest Services NRIS (Natural Resource Information System) were all examined to determine previously documented special status plan locations within or in close proximity to the BLM portion of the project area. There are no federally listed threatened or endangered plant species known or suspected to occur within the BLM portion of the project area. In addition, there are no special status plants previously documented to occur in the BLM portion of the project area.

The following plant taxa have potential to occur within the proposed project area based upon habitats present in the project area and habitat preferences of these special status plants.

Common Name (Scientific Name)	Habitat	Survey Time
Upward-lobed moonwort (*Botrychium ascendens*)	Mesic meadows, shrublands, and roadsides	June-July
Crenulate moonwort (*Botrychium crenulatum*)	Mesic meadows, shrublands, forests, and roadsides	June-July
Western moonwort (*Botrychium hesperium*)	Mesic meadows, shrublands, forests, and roadsides	June-July
Skinny moonwort (*Botrychium lineare*)	Mesic meadows and roadsides	Jun-Aug
Moonwort (*Botrychium lunaria*)	Mesic meadows, shrublands, forests, and roadsides	Jun-Aug
Twin-spike moonwort (*Botrychium paradoxum*)	Mesic meadows, shrublands, forests, and roadsides	Jun-Aug
Cordilleran sedge (*Carex cordillerana*)	Rocky slopes, usually in shade of trees and shrubs	Jun-Aug
Retrorse sedge (*Carex retrorsa*)	Floodplain forests, swamps, streamsides, wet thickets, and wet meadows	Jun-Aug
Rustic paintbrush (*Castilleja flava* var. *rustica*)	Mountain sagebrush steppe	Jun-Aug

Common Name (Scientific Name)	Habitat	Survey Time
Stalked-Leaved Monkeyflower (*Erythranthe patula*)	Riparian areas in forests or grasslands	Apr-Jul
Many-flowered Phlox (*Phlox multiflora*)	Open or wooded often rocky places, from the foothills to above timberline	May-Aug
Violet suksdorfia (*Suksdorfia violacea*)	Cliffs and talus slopes in coniferous forests	Jun-Jul
Douglas clover (*Trifolium douglasii*)	Moist to wet meadows and forested wetlands, and streambanks	Jun-Jul

Effects - USFS

Of the 25 plant species identified in the pre-field as documented on the forest and possibly occurring in the planning area, there will be **no impact** to eight of the nine currently listed (Dec 9, 2011) Region – 6 Sensitive Plant species known to occur, or discovered during sensitive plant surveys.

Table 86 - Effects Call by Species for East Face Project Area

Scientific Name	Common Name	Effect call for East Face Project; Alternatives 2, 3, 4 and 5
Barbilophozia lycopoidioides	Maple leafwort	No Impact - ATP
Botrychium montanum	Mountain grape-fern	No Impact - ATP
Botrychium pedunculosum	Stalked moonwart	
Campylium stellatum	Star compylium moss	No Activities / no impact
Helodium blandowii	Blandow's feather/wetland moss	No Activities / no impact
Hydnotrya michaelis	unknown	No Activities / no impact
Pinus albicaulis	White bark pine	MIIH / Beneficial
Tomentypnum nitens	Tomentypnum moss	No Activities / no impact
Utricularia minor	Lesser bladderwort	No Impact - ATP

Barbilophozia lycopodioides, *Botrychium montanum* and *Botrychium pedunculosum* have been located within the project area. There will be **no impact** to the previously discovered locations for sensitive *Botrychium* species; nor *Barbilophozia* as they will be designated as Areas to Protect (ATP) under mitigations for project implementation.

There will be **no impact** to previously discovered locations for the star compylium moss, Blandow's feather/wetland moss, *Hydnotrya michaelis, Tomenytpum nituns* or *Utricularia minor*. These plants are primarily associated with aquatic and wetland habitats. No project activities are proposed at these locations, which will be designated as ATP.

There **may be impacts to habitat** (MIIH) or to the coniferous species *Pinus albicaulis*, as the silviculture treatments for these stands are designed to restore and protect the species. Stands that are identified as having mature whitebark pine will be cleared around. It is anticipated that the treatments will be **beneficial** to the species in the long run by reducing potential for competition and vulnerability to insects.

There are no known occurrences for any Threatened, Endangered or Proposed plant species. No plants or habitat were located during surveys within the project analysis area. There will be **no direct, indirect or cumulative effect** to any proposed, threatened, or endangered plant species from project implementation.

There will be **no impacts** to eight of the nine sensitive plant species documented for the East Face project area. All site locations will be designated as ATP. The project may imapct indiavidual plants or habitat but is not expected to result in a trend to listing.

Consistency with Federal Regulations and the Wallowa–Whitman Forest Plan

This project complies with present Federal Regulations (ESA) pertaining to the management of Threatened, Endangered and Sensitive plant species. This project is also consistent with the Land and Resource Management Plan for the Wallowa-Whitman National Forest.

Effects – BLM

No direct impacts are anticipated to occur to special status plants due to the project design features which would provide for buffers and avoidance of special status plant sites on BLM lands should any be discovered within the project area during field surveys before project layout and design. The indirect effects of removing overstory trees above special status plant sites would be to change the microclimate at these sites. This has the potential to make these habitat areas less habitable to special status plants. Soil disturbance during logging operations and prescribed burning has a potential to increase nonnative weedy plants on BLM lands potentially creating a source of increased competition for special status plants. These potential negative short term indirect effects would be minimized due to project design criteria and the long term benefits of reducing the potential for uncharacteristic severe wildfire in all action alternatives.

B. Wildlife

The following table summarizes the effects on PETS wildlife species in the East Face project area.

Table 87 - Proposed Endangered, Threatened or Sensitive species known or suspected to occur on the Wallowa-Whitman NF.

STATUS1	Species	WAW2,3	La Grande District3	East Face Project Area4	Addressed in this BE	Effects Determination5
	AMPHIBIANS					
Sensitive	Rocky Mt tailed frog *Ascaphus montanus*	**D**	Known Habitat	Potential Habitat	X	MIIH
Sensitive	Columbia spotted frog *Rana luteiventris*	**D**	Known Habitat	Known Habitat	X	MIIH
	BIRDS					
Sensitive	Northern bald eagle *Haliaeetus leucocephalus*	**D**	Known Habitat	No Habitat	X	MIIH
Sensitive	Lewis' woodpecker *Melanerpes lewis*	**D**	Known Habitat	Potential Habitat	X	BI
Sensitive	White-headed woodpecker *Picoides albolarvatus*	**D**	Known Habitat	Known Habitat	X	BI
	MAMMALS					
Threatened	Canada lynx *Felix lynx canadensis*	**D**	Known Habitat	No Habitat	X	NI
Sensitive	North American wolverine *Gulo gulo luteus*	**D**	Known Habitat	Potential Habitat	X	MIIH
Sensitive	Gray wolf *Canis lupus*	**D**	Known Habitat	Potential Habitat	X	MIIH
Sensitive	Fringed myotis *Myotis thysanodes*	**D**	Known Habitat	Potential Habitat	X	MIIH
	INVERTEBRATES					
Sensitive	Johnson's hairstreak *Callophrys johnsoni*	**D**	Known Habitat	Potential Habitat	X	MIIH
Sensitive	Intermountain sulphur *Colia Christina pseudochristina*	**D**	Potential Habitat	Potential Habitat	X	MIIH
Sensitive	Western bumblebee *Bombus occidentalis*	**D**	Known Habitat	Known Habitat	X	MIIH
Sensitive	Fir pinwheel *Radiodiscus albietum*	**S**	Known Habitat	Known Habitat	X	MIIH

2WAW= Wallowa-Whitman NF
3D = documented occurrence, S= suspected occurrence
5**Listed species**: NE = No Effect, LAA = May Affect-Likely to Adversely Affect, NLAA = May Affect – Not Likely to Adversely Affect, BE = Beneficial Effect
Sensitive species: NI = No Impact, MIIH = May Impact Individuals or Habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species, WIFV = Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards federal listing or cause a loss of viability to the population or species, BI = Beneficial Impact

C. Fisheries

ALTERNATIVE 1 – No Action

The No Action Alternative May Affect, but is Not Likely to Adversely Affect Columbia River Basin bull trout or their designated critical habitat. These are primarily indirect effects due to non-treatment of stands that could lead to disease, insect infestation, increased risk of high intensity wildfire, increased sedimentation from wildfire, and suppression of conifers from competition that could lead to a decrease in large trees for future recruitment to the stream channel and stream shade. While there is a potential for negative affects to fish and habitat from increased sediment yield to fishbearing streams as a result of wildfire, the actual effects to fish and fish habitat is unknown so a Not Likely to Adversely Affect determination was reached for this alternative.

The No Action Alternative may impact redband trout individuals or habitat for this species, but is not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species.

ALTERNATIVES 2, 3, 4 and 5

Columbia Basin Bull Trout and Designated Critical Habitat

Alternative 2, 3, 4 and 5 May Affect, Likely to Adversely Affect bull trout or designated critical habitat for bull trout. This determination is based on the following:

- Culvert replacement on Wolf Creek, Class I stream with Bull Trout to improve fish passage, direct short term effects increase in sediment and turbidity when site is rewatered after construction associated with culvert removal, installation, instream channel work is proposed in all action alternatives. This will have the overall beneficial effect of improved passage to fish to 5.2 miles of upstream habitat.
- Bridge replacement on 7312 North Fork Anthony Creek, Class I stream with Bull Trout
- All commercial harvest units adjacent to fish bearing streams would have RHCA widths implemented as no activity stream buffers. RHCA widths will prevent indirect effects to listed fish and designated critical habitat.
- For FFU activities where mechanical treatment would occur, RHCA widths will be implemented as no activity stream buffers. These would prevent direct and indirect effects to listed fish and designated critical habitat.
- Hand treatment within RHCAs combined with minimum no activity stream buffers will prevent direct and indirect effects to fish and fish habitat.
- No activity stream buffers for handwork proposed within RHCAs along fishbearing streams are based on the riparian microclimate.
- There will be no direct ignition of prescribed fire within RHCAs.

- All action alternatives with the exception of Alternative 3 propose use of temporary roads which are within RHCAs and where culvert installation and removal is necessary having direct and indirect effects to water quality.
- Some amount of sediment would reach fishbearing streams from the use of closed roads that cross Class I streams, traverse RHCA buffers, and require reconstruction within RHCAs. Mitigation will be used to minimize effects such as use of closed roads during dry or frozen conditions.
- Draw bottom roads would be opened for project use.

Redband Trout

Implementation of the East Face Project may impact redband trout individuals or habitat for this species, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Soils

Introduction

The following describes the existing conditions and effects of implementing the East Face project on the soils resources within the project area. Specific unit by unit information can be found in the East Face Soils Report in the project Analysis File.

Existing Conditions

The dominant soils in the East Face project area developed over layers of volcanic derived basalt, andesite and volcanic breccia's, collectively described as Columbia River basalts. These basalt and andesite colluvium derived soils, the most typical within the Blue and Ochoco Mountains (Johnson and Clausnitzer, 1992) are represented in the northern portions of the project area. Within the southern portion of the project area, granitic soils are found. This granitic intrusion, the Anthony Lake Granodiorite Formation (Taubeneck 1957) of the Bald Mountain Batholith, is most noticeable in the Anthony Lakes recreation area. This mass of granitic rock extends for over 144 square miles (Orr et al. 1992). The resultant decomposed granitic soils on the southern portion of the East Face project are found within many of the proposed treatment units south of Wolf Creek.

The arrangement of these soils vary greatly and may range from those on thin, rocky, low-productivity ridgetop scablands to those in deep ash accumulations on very productive grand fir sites.

In the majority of the area the soil is buried under a mantle or cap of volcanic ash deposited from the eruption of Glacier Peak (12,000 years ago) and Mount Mazama (6600 years ago).

Soils with a high amount of ash in surface horizons are common in the project area, ranging from relatively thick to non-existent. Ash-cap soils derived from volcanic eruptions are most often classified in the silt or sandy loam categories. They are also characterized by low bulk density, high porosity, and high water holding capacity. They tend to be non-cohesive and because of their relatively low strength, are highly susceptible to compaction (Johnson, Page-Dumroese and Han 2007). Ash-cap soils can be susceptible to disturbance during forest management, and strategies to predict compaction, displacement and erosion hazards are essential for planning forest management operations (Curran, Green and Maynard 2007). Soil depth, combined with the depth of the unconsolidated material lying over bedrock in the project area ranges from very shallow (less than 10 inches) to deep (40-60 inches). The surface soil layer is the layer that supports the root zone for fine and medium size roots.

Soils with an ash mantle commonly have a different surface texture than the material buried beneath the ash. Typically, soil textures in the project area are silt loams with varying rock content. Subsurface layers in the project area are generally rockier than surface layers. In general, soils consist of basalt or andesite parent material with a volcanic ash-cap over colluvium and residuum.

Soils information for this analysis was obtained and interpreted through data collected by the NRCS Soil Data Mart website and the WWNF Ecological Unit Inventory (EUI). The EUI, which meets the standards of the National Cooperative Soil Survey, describes soil map units, their individual components, and provides interpretive information on soil use and management.

Soil Description

In the East Face project area, soils within the treatment units occur within several Land Type Associations (LTAs). LTAs are a product of the interaction between soils, geology, landforms, vegetation and climate. For this project, soils are described in relationship to the LTAs where they occur (Table 88).

Table 88 - East Face Project Land type Association (LTA) description.

LTA	Geology Group	Landform	Project area Acres (47,621)	Percent of project area
116	Basic Igneous Rocks	Mountain Slopes, Gentle	14,670	32%
117	Basic Igneous Rocks	Mountain Slopes, Steep	3,013	6%
126	Clay Producing materials	Mountain Slopes, Gentle	996	2%
131	Glacial-Undifferentiated	Trough Floors	3,263	7%
132	Glacial-Undifferentiated	Trough Walls, Cirques, & Alpine Ridges	3,056	7%
156	Acid Igneous Rocks-	Mountain Slopes, Gentle	10,583	23%
157	Acid Igneous Rocks-	Mountain Slopes, Steep	4,833	10%
167	Exotic Terrane Rocks- Seafloor	Mountain Slopes, Steep	5,693	12%
231	Glacial-Undifferentiated	Trough Floors	183	<1%
Unknown			159	<1%

The number of acres of land types indicated in the table above is not exact, but has been condensed and rounded to indicate relative amounts of major land types. Also, the LTAs in the project area are complexes and are made up of several soil series further described as map unit symbols (MUS). The major soil series were used to determine the soil properties of the LTA and the minor and other soil series were considered but not used individually.

Table 89 – LTA Descriptions for the East Face Project Area

Landtype Major Soil Series	Soil Depth	Surface (0-10”)				
		Surface Texture	Kw factor	1/3 bar Bulk Density	Drainage Class	Erosion Hazard Rating Un-vegetated
LTA 116 Limberjim	40-60”	Ashy silt loam	0.43 Highly Erodible	0.75 High Compaction	Well	Moderate
LTA 117 Klicker	10-20”	Gravely Silt loam	0.28 Moderately Erodible	0.75-1.25 High to Moderate Compaction	Well	Moderate-Severe
LTA 126 Syrupcreek	20-60”	Ashy silt loam	**0.55** Highly Erodible	0.75 High Compaction	Well	Moderate
LTA 126 Bler	20-40”	Ashy silt loam	**0.55** Highly Erodible	0.75-1.41 High to Low Compaction	Well	Moderate-Severe
LTA 131 Mudlakebasin	20-40”	Ashy silt loam	**0.55** Highly Erodible	0.82	Well	Moderate
LTA 131 Muddycreek	Greater than 60”	Extremely stony ashy sandy loam	**0.43** Highly Erodible	1.15 Low Compaction	Well	Severe
LTA 132 Mudlakebasin	20-40”	Ashy silt loam	**0.55** Highly Erodible	0.75-0.82 High Compaction	Well	Moderate-Very Severe
LTA 156 Prouty	20-40	Gravely ashy loam	.17 Low Erodibility	0.78 High Compaction	Well	Moderate
LTA 157 Warfield	40-60”	Gravely ashy sandy loam	.24 Moderate Erodibility	0.82-1.03 High to Moderate Compaction	Well	Severe-Very Severe
LTA 167 Analulu	20-40”	Very gravelly loam	.15 Low Erodibility	0.91-1.03 Moderate Compaction	Well	Moderate-Very Severe
LTA 167 Gutridge	40-60”	Gravelly ashy silt loam	.32 Moderate Erodibility	0.75-0.85 High Compaction	Well	Moderate-Severe
LTA 231 Bata	Greater than 60	Gravely ashy silt loam	.20 Moderate Erodibility	0.82-1.03 High to Moderate Compaction	Well	Moderate-Severe

Soil erosion is a natural process that can be accelerated by land management activities; it depends on soil texture, rock content, vegetative cover and slope. Ash soils have higher soil erosion hazard ratings than other soils because of their low bulk density and high detachability. This can be ameliorated by operating on slopes less than 30% with good vegetative cover. Vegetation binds soil particles together with roots, and vegetative cover – including biological crust and duff/surface material – protects the soil surface from raindrop impact and dissipates the energy of overland flow.

Individual soils found within the East Face project area along with soil properties of erodibility (Kw factor) and compaction potential (bulk density) were assessed from data available from the NRCS Soil Data Mart website. Surface soils within the project area range from 0 inches at rock outcrops to greater than 60 inches deep.

Individual soils are grouped together to create "map units" or "soil complexes" which retain the properties of each individual soil. Most of the dominant soil complexes are derived from ash mantle cover or ashy silt loams and have a high inherent compaction potential. Compaction potential increases when rock fragments within the soil decreases and ash component increases.

Soil with bulk densities greater than 1.0g/cc generally indicates a lower compaction potential. These soils contain higher percentages of rock fragments which increases bulk density and reduces potential erodibility. Soils with bulk densities less than 1.0g/cc indicate a higher compaction potential due to higher porosity, weaker structural development, lower cohesion and lower coarse fragment (>2mm) content (Craig and Howes, 2005).

0.65-0.85g/cc= Low BD= High compaction potential
0.85-1.1g/cc= Moderate BD= Moderate compaction potential
1.1-1.4g/cc= High BD= Low compaction potential

Most treatment units were identified as having between 0.65-0.85g/cc bulk density at 1/3 bar pressure for the dominant MUS, indicating high compaction potential.

The inherent erodibility of soils is calculated in a laboratory in the absence of live vegetation or effective ground cover and is based on soil texture and detachability, not slope gradient. Most treatment units were identified as having moderate to very severe erosion hazard without vegetation. With the addition of live vegetation and associated root mass or organic duff layer, the surface erosion potential due to overland flow is greatly reduced.

This erodibility is also described as the K factor. The Kw factor = the actual erodibility of the soil profile and is based on all inorganic components of the soil.

Kw factor = 0.05-0.2 is low erodibility
Kw factor = 0.2-0.4 is moderately erodible
Kw factor > 0.4 is highly erodible

Soil Productivity

Soil productivity of a site is defined as the ability of a geographic area to produce vegetative biomass, as determined by abiotic conditions (e.g. soil type and depth, rainfall and temperature) in that area. Specifically as related to soils in this analysis, productivity is related to the capacity or suitability of a soil for establishment and growth of appropriate plant species, primarily through physical impediment to root growth, water availability, and nutrient availability.

Productivity of forested and non-forested plant communities is closely related to ash and loess content in soils. Unique characteristics of ash soils include: 1) high water holding capacity, 2) high water infiltration rates, 3) low compatibility, 4) high detachability and 5) disproportionately high amounts of nutrients in upper surface layers. Under undisturbed conditions, these soils support good vegetation cover which protects the ash from erosion (USDA, 1985).

The productivity of forest soils can be adversely affected by removal of nutrients and alterations in the soil structure. Removal of nutrients can occur through the removal of vegetation (i.e. trees, shrubs and grasses), erosion, preparation of sites for treatment and burning. The effects of soil disturbance on soil productivity and the duration of adverse effects largely depend upon the type of disturbance. Disturbances such as roads and ditches generally are long term because the soil structure is severely altered during construction. Compaction from tractor yarding can potentially last for several decades (Froehlich and McNabb 1984), thereby reducing productivity. Soil surface erosion rates following timber harvest can potentially remain elevated for several years, depending upon the yarding method (Johnson et al. 2007). The effects of nutrient removal through woody debris removal, erosion, burning and site preparation can be short lived, or long lasting depending upon the extent, duration and intensity of the disturbance (Harvey et al. 1994).

Sheet and Rill Erosion

Soil erodibility is a function of cohesion, infiltration rate, and permeability of lower horizons, uniformity of slope and slope percent, water concentration potential, distribution of annual precipitation, rainfall intensities, soil temperatures, and the density of effective ground cover before and following disturbance. Soil erosion is a natural process that can be accelerated by land management activities. Soils on steep slopes with poor vegetative cover and lack of structural development are more susceptible to erosion than are soils on flatter terrain. Vegetation protects the soil surface from raindrop impact, dissipates the energy of overland flow, and binds soil particles together.

Gully and Landslide Erosion

The project area is generally a stable landscape and the potential for landslides to occur is relatively low with some moderate potential on steeper slopes. When vegetated, the soils and geology in the project area are not prone to mass movement. There are prehistoric landslides within the East Face project area (Oregon Department of Geology) but none are known to be currently active.

Soil Compaction and Displacement

In the East Face project area soil compaction is a primary disturbance factor affecting soil productivity. Skid trails, landings and non-surfaced roads, ATV trails and dispersed campsites all have led to increased soil compaction and bulk density throughout the project area.

Soil displacement is the movement of soil from one place to another by mechanical forces and is typically associated with roads, landings, and skid trails. Effects include reduced water holding capacity, loss of ground cover, nutrients and soil microorganisms, and increased runoff due to an increased amount and condition of bare ground exposed (Page-Dumroese et al 2007.

Detrimental Soil Conditions

The Forest Plan defines detrimental soil condition as any management practice that results in soil compaction, puddling, displacement, erosion, mass wasting, or severe burning. Soil damage can negatively affect the productivity of a site. Generally speaking vegetative, forest floor, and soil process appear to be functioning properly in the majority of the project area. Residual soil disturbance is limited due to the topography and the ability of the soil and vegetation to recover following disturbance in this area.

The majority of soil compaction occurs on the existing system haul roads, which are relatively abundant due to past harvest activities in the project area.

Soil displacement is defined as the movement of soil from one place to another by mechanical forces such as a wheel, blade or animal hoof. Evidence of surface soil displacement by mechanical disturbance is relatively limited within the East Face project area however areas with user created roads are frequent.

The majority of soil displacement occurs on the existing system haul roads, which are relatively abundant due to past harvest activities in the project area.

The total existing percent detrimental soil conditions (DSCs) in each potential mechanical unit within the East Face project is displayed in Appendix A of the Soils Effects analysis is in the East Face Analysis File. Existing detrimental soil conditions (DSCs) were determined for each unit within the East Face project area. DSCs within the units in the project area range from a low of 0% to a high of 14% with an average across the planning area of approximately 4%. This estimate was calculated based on an assessment or estimation of the existing DSCs within the unit boundaries and then re-calculated to include DSCs attributable to the existing roads within or adjacent to each unit.

Existing road acreage for roads totally within a unit was reached by multiplying the miles (converted to feet) of road by an average of 20 ft. width and dividing by 43,560. Existing road acreage for roads adjacent to a unit was calculated using a 12 ft. width.

An estimated 1% percent DSCs was used for each treatment unit not inventoried based on the expected level of DSCs for similar units with similar past harvest activities the project area.

Effects

Introduction

The following displays the effects on soil resources for the proposed 47,621 acre East Face project. Specific effects to soil resources are further detailed to the treatment unit as necessary to provide site specificity. Treatment units are used for analysis since these are the areas where measurable effects to soil resources occur, including cumulative effects. Unit of measure is typically by the acre, a percentage of the unit in question and miles of road.

Assumptions

Effects to soils can be short-lived (one to three years) in the case of erosion potential; soil erosion potential depends on soil type and vegetative cover to determine how long risk of erosion is a concern. Erosion control measures normally occur immediately following treatments and / or re-vegetation occurs in the first year or two. Other effects to soils such as compaction, rutting, and displacement tend to be longer term impacts that are cumulative in nature if these types of impacts have not fully recovered when new activity occurs in the same location.

Management activities can result in direct, indirect and cumulative effects on soil productivity and soil stability (USFS 1998). Effects may be beneficial or adverse. Effects may include alteration of physical, chemical, and / or biological characteristics or properties of soils. Many standards and guidelines in the Forest Plan, in addition to the five identified specifically in the soils section, relate to soil function, soil productivity and soil stability.

The most adverse effects of management activities on soils are described as detrimental compaction, detrimental puddling, detrimental displacement, detrimental burning, detrimental erosion, and detrimental mass wasting; other concerns include adverse changes in vegetation and organic matter on the soil surface, and adverse changes in water table (USFS 1998). Soil compaction, puddling, displacement, severe burning, and impacts to ground cover (vegetation and organic matter) are direct effects; soil erosion, mass wasting, and changes in water table are indirect effects. Cumulative effects are the sum of incremental changes in past, present, and reasonably foreseeable future direct / indirect effects on the soil resource that overlap both in time and space. Recent past, ongoing, and foreseeable future effects are captured in Appendix D of the East Face project analysis document.

The magnitude of the effects of an activity on soil function, soil productivity and soil stability are described by the speed, direction (upward / downward), extent, and duration of change. Minimizing productivity losses associated with any action can be accomplished by managing the magnitude of detrimental soil conditions (DSCs) within activity areas through prescription and/or mitigation. DSCs are to be minimized, with total acreage detrimentally impacted not to exceed 20 percent of the total acreage in the project area including landings and system roads. The project area is identified as each treatment unit for determining DSCs prior to treatment (WW interim protocol 2002). Post treatment restoration is necessary for areas that exceed this standard and guide. (LRMP 4-21).

Planned management activities must minimize new soil damage and must provide for restoration measures when and where they are appropriate (WWNF 1990, Soils S&Gs).

Cumulative effects are rated as negligible, minor, moderate or major based on professional judgment. Negligible means the effect of an activity on an indicator was so small it was not measurable, or caused a change of less than 1%, or less than 1% of an area was affected. Minor means the effect was a change equal to less than one-half of the flexibility for a standard, or 1-10% of an area was affected. Moderate means the effect was a change equal to more than one-half of the flexibility for a standard, or 11-20% of an area was affected. Major means a standard was exceeded or more than 20% of an area or resource was affected; e.g. the detrimental soil condition threshold is 20% (USFS 1998).

Ground Based Logging Model

Utilizing modern harvest equipment and technique, the East Face Project design will utilize skid trails an average of 60-75 feet apart on tractor ground (35% and less slope). This spacing will accommodate forwarder or whole tree removal systems. Bliss et.al, 2006, determined that at this spacing, new ground based yarding activities would disturb about 10-20% of the ground surface dependent upon type of equipment used (Table 90).

Equipment choice will either increase or decrease potential accrual of DSC's. Full suspension removal equipment would be in the lower estimation of DSC as the logs are not displacing soil between the wheel tracks. Partial suspension (grapple) results in moderate displacement of soil between wheel tracks whereas non-suspension or cable skidding results in displacement of the entire width of the skid trail.

Past monitoring has shown that 50% of skid trail width is detrimentally compacted and displaced, resulting in approximately 8-10% DSCs per unit before implementation of mitigations (Bliss, WWNF, 2006). Landings would occupy about 1-2% of a unit. The effect of skid trails plus landings would be about 10-12% new DSCs before subsoiling in those units where there no pre-existing conditions (DSCs) occur. Subsoiling as mitigation can be prescribed for those units where DSCs would potentially exceed LRMP standards.

Table 90 - Skid trail spacing and associated potential cumulative DSC's

Elements	Spacing/Width/Potential DSC			
Skid Trail Spacing	60'	75'	80'	100'
Skid Trail width	12'	12'	12'	12'
Potential surface disturbance	20%	16%	15%	12%
Expected DSC- (50% of total surface disturbance by treatment unit)	10-12%	8-10%	7-9%	6-8%

As noted in the soils existing condition section, ground transects of older tractor logging impacts in the project area indicate that low levels of DSCs (average of 1-2%). Many areas showed little to no visible skid trails remaining, precluding the reuse of these past tracks. There was little disturbance (less than or equal to 1%) in units where selective harvest did not produce multiple skid trails. This would suggest that the level of DSCs within the project area would not measurably increase post-harvest using similar logging techniques and mitigations.

Using the results of this survey, 10-20% new ground surface disturbance would be equivalent to an average range of 6-12% potential DSCs (including 1-2% landing disturbance) in those units where no past entry had occurred. Several factors would influence actual effects of new activity, such as equipment type, operator skill, coarse woody debris and slope gradient; use of existing skid trail network and landings; and soil moisture, rockiness and density. With 60-foot skid trail spacing on volcanic ash soils, potential DSCs could be in the upper half of the 6-12% DSC range, or about 10-12% DSCs. For this analysis, 10% new DSCs was used for analyzing tractor units with no past entry and 8% new DSCs for any unit with past tractor entry. It is expected that some past harvest unit skid trails may be reused, thereby reducing the potential accrual of new DSCs.

Soil effects resulting from the use of a forwarder instead of a tractor would similar however forwarder based removal systems generally result in slightly lower accumulation of DSC's (Bliss, WWNF, 2003). This project does not differentiate between tractor or forwarder based harvest and has used tractor based logging as the baseline for effects analysis of potential DSCs. The exception to this estimate is where soils were rated severe or very severe for erosion without vegetation. Cut to length harvest where the tops and limbs are left onsite and forwarders used for removal is required for these units to allow retention of biomass to reduce surface erosion following log removal. This mitigation is expected to reduce accumulation of new DSC's to 8%. Biomass removal as proposed in Alternative 5 is expected to have similar effects as forwarder removal and will be estimated as such.

Roads Effects Model

Road effects can be modeled for two slope positions: gently sloping ridges and benches, and moderately steep side slopes. Roads on ridges and benches would be about 12-14 feet wide, with an average disturbed area of 1.6 acres per mile. Roads on side slopes would be 20-30 feet wide, with an average disturbed area of 3 acres per mile. This is equivalent to a 25 foot wide roadway, top of cut to bottom of fill. The entire disturbed area will be treated as a DSC. (Derived from Bliss, WWNF 2006)

For this analysis an average of 20 feet was used to determine DSC's across the project.

Temporary Road Effects Model

Temporary road effects are expected to be the same as permanent roads unless mitigations are implemented. A reduction of 80-90% of the accumulated DSCs can be expected with re-contouring. Total residual DSC's would remain at 10-20% due to mixing of the soil and because re-contouring does not exactly recreate the pre-road slope shape and soil depth (derived from Bliss, WWNF 2006).

For this analysis an average of 12 feet was used to display DSC's across the project. Residual accumulated DSC's would be 20% of total area affected following mitigation of recontouring.

Underburn Effects Model

Burn effects are based on definitions in (DeBano et. al 1998) and (USFS 1998). Underburn effects qualify as detrimental soil conditions if they are severe burns and occupy an area of at least 100 square feet (USFS 1998). Local data (Bliss 2003a) indicates there would be 0-4% severe burn effects in prescribed fire underburn areas, but no DSCs because severe burn areas would be less than 100 square feet. Severe burn effects typically occur adjacent to and under logs and in burned out stump holes. Underburn effects may range from low-severity burn class to high-severity burn class, based on percent moderate fire severity, but do not qualify as detrimental soil conditions.

Grapple Pile Effects Model

Effects are based on definitions of detrimental compaction and displacement (USFS 1998). The equipment to be used for grapple piling of woody debris would be a low ground pressure tracked vehicle with a grapple. Normal use would track a maximum of 8% of a treatment unit. Total ground disturbance would be 5-8% with an estimate of 2% DSCs. Actual DSCs would be affected by variables such as soil density, percent rock in/on the soil surface greater than 3 inch diameter, soil moisture (veg type and woody debris tonnage) type of equipment used and operator skill.

Slashbuster treatment would have similar disturbances (Naughton pers comm.) although the material following treatment would remain on site and reduce potential compaction and displacement, estimate 2% DSCs.

Methodology

The above models were used in analyzing potential detrimental soil compaction conditions from project activities.

Post-harvest monitoring will be completed on ten percent of the mechanical units to ensure that project design and mitigations are properly implemented to ensure DSC levels remain below Forest Plan minimums.

For ground based removal, methods such as operating seasons, use of existing landings and skid trails, subsoiling, seeding skid trails, etc. are effective measures for minimizing or rehabilitating potential soil impacts. Utilizing these methods is expected to maintain DSC levels well within Forest Plan standards and guidelines for the proposed action.

In the following discussion, the degree of impact, of compaction, puddling, displacement, severe burning, erosion, mass wasting, organic matter loss and drainage class change is severe enough to classify effects as DSCs. Extent is described generally as affected area and duration is noted as years. The effects outlined below are based on soil mitigation measures being implemented in full.

Direct and Indirect Effects on Soil Quality

ALTERNATIVE 1- No Action

This is the no action alternative, which means that all actions authorized by current management plans, permits, easements, and contracts would continue. Authorized actions on National Forest lands in the project area include agency actions, such as road maintenance and noxious weed treatments, and public actions such as fuel-wood removal, mining, and various types of recreation.

All current detrimental soil conditions would continue to exist, with some conditions improving, others remaining static, and still others deteriorating over time. Plus some new detrimental soil conditions are likely to occur from the above listed ongoing activities.

In the following discussion, the degree of impact of compaction, puddling, displacement, severe burning, erosion, mass wasting, organic matter loss and drainage class change is severe enough to classify effects as DSCs. Extent is described generally as affected area and duration is noted as years.

Ongoing activities effects on soil quality would include:

Compaction and Puddling: These soil impacts are associated with skid trails, landings and non-surfaced roads, ATV trails, livestock trails and dispersed campsites. Effects include reduced water holding capacity, infiltration and permeability, reduced ability of soil to support vegetation and organisms in and on the soil, increased runoff and in extreme cases, a change in drainage class.

Reoccurring uses by wildlife, ATVs, vehicles and equipment could potentially re-compact or re-puddle these areas. Where recurring impacts are low to non-existent, existing compaction, and puddling would improve over time in the top 4 inches, due to beneficial effects of frost heaving, root establishment of vegetation, and rodent activity. Compaction deeper than 4 inches could persist 20 to potentially 100+ years.

Displacement: These soil impacts are associated with system roads, previously used landings, skid trails and rock-pits. Effects include reduced water holding capacity, loss of ground cover, nutrients and soil microorganisms and increased runoff due to an increased amount and condition of bare ground exposed. Duration of effects is permanent, unless soils are replaced with equipment, however some soil mixing would still occur.

Severe Burning & Organic Matter Loss: These soil impacts are associated with areas with soil displacement, discussed above, plus areas that experience prescribed fire and wildfire. Effects include short-term to long-term loss of organic ground cover (duff, litter, coarse wood, basal area of herbaceous plants) and canopy cover (herbaceous plants, shrubs, trees). Severely burned soils experience nutrient loss, microorganism mortality, increased water repellency, runoff and erosion hazard.

Organic matter would continue to accumulate and recycle in rangeland and forestland plant communities. Organic matter accumulations would be slowest in rangelands and in forestlands where the canopy has been removed. In areas where the canopy cover is present, organic matter accumulations on the forest floor would equal or exceed historic accumulation rates due to current fire control activities, which would continue to maintain or improve soil productivity. Existing disturbed areas such as skid trails, landings, and decommissioned roads would continue to have lower than normal accumulations of organic matter on the soil surface. Moderate to severe burn effects would decrease as trees, herbaceous plants, and soil flora and fauna re-colonize burned sites and organic matter accumulates.

The potential for high intensity wildfires increases every year in the absence of forest density management and surface soil organic matter management. In the event of a wildfire, the potential effects upon soil productivity, extent of post-fire soil erosion, and the length of time needed for soil recovery from those impacts would depend primarily upon the fire intensity, mosaic, and fire size. The length of time needed for soil recovery would depend upon residual post-fire surface soil organic matter, soil erosion, and the length of time needed for ground cover reestablishment. Stand replacing wildfires could reduce long-term soil productivity by removing litter, humus, and large downed woody material from the soil surface, by consuming soil organic matter, and by killing soil flora and fauna essential to the nutrient recycling process to a 9 to 16 cm soil depth. Surface soils and their associated nutrient reserves could also be lost through increased erosion due to loss of ground cover and due to soil crusting and water repellency, which reduces infiltration.

Drainage Class (Soil Moisture Regime): Changes in soil drainage class exist where rock-pits store water, where water collects in puddles on native surface roads, and where road fills have covered riparian wetlands. No change in soil drainage class is expected over time under this alternative.

ALTERNATIVES 2, 3, 4 and 5

Ground Based Treatment (HFU, HTH, HIM, HPO, HSH, HSA, Grapple Pile, Mastication, Biomass Removal)

The most important direct effects of treatment activities on soils are compaction and displacement of litter, duff and topsoil by mechanical equipment. Most of these effects would be in ground based yarding units with reduced effects in the units where mastication or grapple piling is proposed. Post-project unit DSCs for all action alternatives range from 0 to 20% with an average of 9% in Alternative 5(due to the additional mechanical acres treated and biomass removal), 8% in Alternative 2, 6% in Alternative 3, and 5% in Alternatives 4 (due to the predominance of non-commercial/non-mechanical fuel reduction treatments). Four units (83, 115, 123, and 128) totaling approximately 160 acres have the highest potential post-project DSCs (18.4-20%). Unit 83 DSCs are primarily because the unit is only an acre in size and has an existing road immediately adjacent to it. DSCs within the unit are only at 1%; however, the road DSCs are 13%. Units 115 (29 acres) has a similar situation with DSC's within the unit at 1% and a DSC of 9.4% from the adjacent road. Although DSCs within these units are currently very low, both units would require forwarder systems and subsoiling of all skid trails and landings post-project to mitigate potential soil compaction and detrimental soil conditions. While Alternative 3 only treats unit 115 of the four units, Alternatives 2 and 5 treats all four and Alternative 4 treats units 123, 115, and 128; however, unit 115 is non-commercial (pre-commercial thinning) and would not increase DSCs above existing. Therefore, due to implementation of design criteria and mitigation measures, expected new DSC's for all treatment units would meet LRMP standards and not be more than 20%, they would be lowest in Alternatives 3 and 4 and higher in Alternatives 5 and 2.

Erosion Hazard: There are up to 99 mechanical treatment units dominated by soils that are severe or very severe for erosion potential. Erosion hazard is determined in the absence of live vegetation. Surface erosion potential due to overland flow is mitigated primarily by rooted vegetation and duff layers on the soil surface. With the exception of bare areas where rain splash erosion may occur, material left on site following mastication or grapple piling will reduce the potential for loss of soil from any treated unit.

Displacement: All units where mechanical treatment is used for vegetative manipulation have the potential for soil displacement.

Units where forwarder based harvest is used will have lower displacement due to the full suspension of the material removed and the use of slash as a surface cover. Units where partial suspension removal is used will result in higher levels of displacement due to logs dragging on the ground surface.

Grapple piling units are at the highest risk for displacement due to the repetitive turning made by track mounted equipment. Retention of higher levels of coarse woody material (CWM) will reduce the number of "grabs" made during grapple piling, or maneuvering required by arm mounted masticators thereby reducing the potential for soil displacement.

<u>Compaction Potential</u>: There are up to 143 mechanical treatment units are dominated by soils with high compaction potential. Ten percent of these units will be reviewed by the district watershed/soils specialist and TSA following treatment to determine if additional mitigations are required to meet objectives.

The use of low ground pressure machines and covering of trails with slash mats such as those generated with cut to length systems can limit the consequences of one or two passes of equipment, but do not appear to be effective in minimizing soil compaction when equipment must use trails multiple times (Froese 2004, Han 2005). Where multiple passes are used, soil will show higher compaction, but compaction should be limited to the ruts of well-defined trails.

Since it is unknown what exactly level of DSC's will be accumulated in each unit, all units where high compaction potential due to ash dominated soils are found will require subsoiling of multiple pass return trails following harvest unless cut to length removal methods are utilized. If post-harvest inspection determines that soil compaction and displacement is minimal due to increased skid trail spacing, use of low displacement removal techniques (cut to length) and harvest during dry/frozen soil periods, subsoiling may not be required.

Increasing the level of CWM on units with high compaction potential, will reduce multiple passes with grapple or mastication machinery, reducing potential for accumulation of additional DSC's. Long term soil productivity of forested ecosystems relies on a continual flux of coarse woody material. Important nutrients to the soil ecosystem, such as sulfur, phosphorus and nitrogen, are supplied by decaying coarse woody material (Graham 1994). Timber harvest, slash disposal and site preparation can reduce the amount of organic material in the forest floor to below what is needed to ensure soil productivity (Harvey et al. 1987). Recent publications have provided information on appropriate levels of coarse wood required to protect long term soil productivity (Agee 1994, Harvey et al. 1994, Graham 1994).

One indirect effect of harvest activities on soils would be the loss of nutrients by removing trees from the ecosystem that would naturally recycle into the soil over the long-term if they were left on site. Prescriptions used for this project will leave adequate residual large and small trees on each unit to replenish this initial loss of stems. Much of the residual woody material will be left on site in the way of tops and roots which will decompose naturally, maintaining soil productivity.

Another effect is increased soil erosion hazard in areas where ground cover is removed by equipment over a large enough area to pose a hazard of long-term accelerated erosion. Vegetation protects the soil surface from raindrop impact, dissipates the energy of overland flow, and binds soil particle together. Soils on steep slopes with poor vegetative cover and lack of structural development are more susceptible to erosion than soils present on flatter terrain. Treatment units are not generally placed within areas where this condition is present.

Given Alternative 5 includes more acres of ground based harvest, effects on the soils and effects to soil quality would be slightly greater than alternative 2, 3 and 4 (table 92). Alternative 4 would have the lowest potential for effect. Under each action alternative, the probable extent of detrimental soil disturbance would be kept under the Forest Plan's standard of 20% in treatment activity areas through the application of BMP's and site specific project design requirements.

<u>Prescribed Fire</u>

In general, the estimated percent additional detrimental soil conditions that maybe be expected from prescribed fire range from 1-2% of the actual area burned. Prescribed fire usually results in a mosaic of low, moderate and high fire severity that would be classified mostly as low severity burn class. Low-severity burn class effects include up to 2% high fire severity, up to 15% moderate fire severity, and at least 83% low fire severity and unburned. There is potential for fall burns and for heavier fuel areas to experience the low end of the moderate-severity burn class.

High fire severity effects are what Region 6 standards define as a detrimental soil condition (FSM 2520). The top of the mineral soil would be reddish to orange. Soil organisms would be killed to a depth of 9 to 16 cm. All organic materials in color-altered soil near the soil surface, plus all litter and humus and most woody debris on the soil surface would be consumed. There would be up to about 1% high fire severity from spring burns and about 2-3% from fall burns.

For moderate severity fire areas, soil organisms would be killed to a depth of 3 to 5 cm. Litter would be consumed and duff would be charred to consumption. Approximately 2-15% of the area would experience moderate fire severity, ranging from 2-5% for spring burns and higher, up to 15%, for fall burns.

For low severity fire areas, soil organisms would be killed to a depth of only 1 cm, and duff would be largely intact with scorching to consumption of litter.

Erosion hazard would increase in moderate and high fire severity areas due to loss of litter and duff on the soil surface. However, change in erosion hazard would be small in low-severity burn class (and low end of moderate-severity burn class) areas where a minimum of 60-70 percent total effective ground cover still exists, there is a good mosaic burn pattern, and a residual forest canopy has the potential to replace litter burned by the fire.

Roads

The primary direct effect of road work on soil quality is detrimental soil displacement, loss of soil productivity and compaction. There is no new specified road construction proposed for this project. Existing roads will be utilized. Temporary roads will be required for alternatives 2, 4 and 5. Temporary roads will be placed on existing user roads where appropriate, reducing the level of disturbance. Temporary roads will be decommissioned following use by filling any cuts, slash placement and seeding with native grasses and forbs.

The primary indirect effect of road work on soil quality is soil erosion. Some soil erosion could occur following use of previously closed roads for administrative and firewood removal uses. Maintenance of roads following industrial use and prohibiting used during periods of high soil moisture or rainfall events will reduce this effect.

Any maintenance required to facilitate use of the existing road system will be done within the existing road prism and will be completed to typical standards for the type of road to be maintained. Table 91 summarizes the miles of road work that would occur under each alternative in the East Face Project.

Table 91 - Miles of Road Work Proposed for Alternatives

Road Work	Alternatives				
	1	2	3	4	5
Closed Roads opened for administrative access (miles)	0.0	107	66.9	38.6	122.7
Roads Reconstructed (miles)	0.0	53	39.3	27.8	61.6
Temporary Roads constructed (miles)	0.0	12.6 (6.0 on existing 2 track) (6.6 new construction)	0.0	2.6 (0.67 on existing 2 track) (1.95 new construction)	14.7 (6.57 on existing 2 track) (8.14 new construction)

For Alternatives 2-5, closed roads reopened would not measurably increase soil displacement as the displacement and mixing has already occurred. Placement of road closure barriers would not cause new soil disturbance outside of the existing roadway. DSC's are included in the total existing condition percentage.

Roads reconstructed will follow standard forest BMPs. Temporary roads would be decommissioned following standard BMPs at the conclusion of their use period. Accumulated DSC's due to soil mixing would occur and however the expected duration of the DSC's would be limited following recolonization of the site with native grasses and other vegetation. Alternative 3 would have no direct or indirect effect of temporary roads on soil resources.

Mechanical Fireline Construction

The primary direct effect of mechanical fireline construction on soil quality and productivity is similar to roads in that some displacement and compaction would occur where the fireline is constructed. Mechanical fireline is by design much less disruptive to the soil profile than road construction.

The primary indirect effect of mechanical fireline construction on soil quality would be erosion. Erosion would occur if firelines are not properly waterbarred following construction or are allowed to remain in place for a full season following construction. Mechanical fireline is rehabilitated following use to prevent erosive channeling of surface runoff.

Cumulative Effects on Soils

Potential cumulative effects are analyzed by considering the proposed activities in the context of past, present and reasonably foreseeable actions. These are the areas where cumulative effects have occurred or may occur. In addition, some activities have an influence that may extend downstream in the subwatershed within the project area boundary. This broad area is referred to as the "cumulative effects analysis area" and in general all alternatives are considered in the context of relevant past, present and reasonably foreseeable activities in this area. Activities which occurred in the past have been incorporated into the existing condition of the project area. A summary table of the present and reasonably foreseeable future management activities in the cumulative effects analysis area is located in Appendix D of the analysis and has been used to assess the cumulative effects of implementing this project on rangeland resources.

ALTERNATIVE 1- No Action

The only present or reasonably foreseeable future action which would overlap in time and space within this project area which may have a potential to have a short term increase in DSCs would be OHV use and livestock grazing. Livestock grazing within the boundaries of the Lobo allotment would continue; however, standards and guidelines for management of livestock use would continue to be implemented minimizing the potential for a measurable increase in area DSCs.

Use of OHVs/snowmobiles in the project area should not measurably increase under Alternative 1 and motor vehicle use off designated roads, trails, and areas would be managed by the forest travel management plan once that is completed which should reduce soil disturbance by motor vehicles.

ALTERNATIVES 2, 3, 4 and 5

Implementation of any of the action alternatives would not increase DSCs within any treatment unit beyond the 20% LRMP threshold. The proposed action also includes mitigations that would decrease the potential for accumulating additional DSCs. It is important to keep in mind that DSCs naturally change over time. Certain DSCs recover in a few years to decades, while other DSCs require recovery times of

100 or more years without restoration treatments. DSCs with long recovery rates are often considered for restoration treatments, where environmentally and economically feasible.

As firewood becomes more difficult to find, firewood gatherers are building firewood roads to get farther to new wood sources. Opening roads for use in East Face has the potential to could increase these user built roads into new areas not previously disturbed. Motor vehicle use off designated roads, trails, and areas would be managed by the forest travel management plan once that is completed which should reduce soil disturbance by motor vehicles and allow current user built roads and trails to recover and revegetate reducing DSCs within the area.

Summary of Effects

The planned actions for all action alternatives adhere to R6 soil quality guidelines for maintaining soil productivity provided that project design features are implemented. The meet R6 soil quality standards, each project unit must have less than 20 percent of its area in detrimental soil conditions or the cumulative effects from project implementation and rehabilitation should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality (R6 Supplement 2500-981). If this threshold for change is reached, corrective actions are taken to restore or stabilize the impacted sites and move the unit towards a net improvement in soil quality.

The East Face project actions are not expected to create detrimental soil conditions in excess of 20% in any activity unit. This determination is consistent with Forest-wide standards for site productivity (USDA 1986). The project would also comply with R6 erosion standards following activities. Implementation of project design features and implementation of project mitigations to reduce and control detrimental soil disturbance can minimize impacts ensuring that these standards are met following project implementation.

Alternative 1 will add no new direct or indirect effects and will create no net increase in detrimental soil condition due to mechanical removal or fuels treatment. The risk of loss of soil quality due to catastrophic wildfire would increase over time with Alternative 1 due to maintaining the current level of fuel loading.

Alternative 2 and 5 treat the most acres with commercial mechanical removal and would accrue the most new DSC's with Alternative 5 creating the most new DSC's. Non-commercial mechanical treatment would be similar for all action alternatives. These alternatives also require the most miles of temporary road to be constructed. Alternative 5 poses the greatest risk to maintain soil quality due to the increased mechanical treatment acreage associated with biomass removal from the non-commercial units.

Table 92 - Treatment comparison for East Face project by acre.

Treatment Type	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total Commercial Mechanical Acres	6,722	3,879	2,844	10,221 (includes 2,560 acres biomass removal)
Total Non-Commercial Mechanical Acres	1,745	1,745	1,700	1,745
Total Post treatment Mechanical Acres	10,704	6,842	8,568	8,083
Total Biomass Removal Acres	0	0	0	2,560
Total Prescribed Fire Acres	6,685	6,043	6,643	6,685
Total Temporary Road Miles	12.6	0.0	2.6	14.7

All alternatives treat the most acres within LTA 116 and LTA 156 (table 93). These LTA's exhibit the highest potential likelihood for soil compaction and displacement due to the high percentage of ash within the soil profile. These are the most sensitive but also the most productive soils within the project area.

Table 93 - Mechanical treatment comparison for East Face project by LTA.

LTA	Alternative 2	Alternative 3	Alternative 4	Alternative 5
116	3,474	2,515	1,562	4,144
117	273	169	166	486
126	272	189	74	272
131	535	280	483	625
132	64	32	64	64
156	2,042	1,328	918	3,220
157	957	485	739	1,600
167	466	275	170	1,130
231	20	20	0	44
TOTAL	**8,103**	**5,293**	**4,176**	**11,585**

Consistency with Laws and Policy

All action alternatives will meet Forest Plan and Regional soil standards designed to maintain long-term soil productivity.

Irreversible and Irretrievable Commitments

The action alternatives are not expected to create any impacts that would cause irreversible damage to soil productivity. Timber harvest or vegetative treatment would avoid landslide prone areas, existing debris slides/debris torrents, and other potentially unstable lands on steep slopes. Careful planning, project design requirements and Best Management Practices would be used to prevent irreversible losses of the soil resource.

Invasive Species/Noxious Weeds

Introduction

This report addresses the existing conditions and the potential effects of the East Face Vegetation Management Project (East Face) as it pertains to non-native (invasive) species. Invasive species are defined as a non-native species whose introduction causes or is likely to cause economic, environmental, or human health harm. An invasive species is distinguished from other non-natives by their ability to spread in native ecosystems. "Noxious weeds" on the other hand, is a legal term used by state, county, and federal agencies to denote plants that pose particular threats, generally to agriculture. Many undesirable non-natives can be invasive and pose threats to healthy native ecosystems but do not meet the criteria for listing as a "noxious weed." For that reason, this analysis will focus on all invasive non-native species and not just those listed as "noxious weeds."

Analysis Framework: Statute, Regulatory Environment, Forest Plan and Other Direction

The Pacific Northwest Region Invasive Plant Program Record of Decision (ROD) (USDA 2005) amended the Forest Plan (amendment #RF-5) for the Wallowa-Whitman National Forest in 2005. The Region 6 ROD outlined 23 standards for the prevention and management of invasive non-native plants that have been added to all regional forest plans and require consideration of invasive species in all planning efforts. The regional ROD does not however, approve any site-specific treatment, instead requires a completed analysis by each National Forest (see the specific sections below for the specific analysis).

Of the 23 prevention and management standards in the regional ROD, only seven directly affect activities found in the East Face project. These standards are:

1. Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis; roads analysis…..vegetation management plans, and other land management assessments.
2. Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism, require the cleaning of all equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands.
3. Use weed-free straw and mulch for all projects, conducted or authorized by the Forest Service, on National Forest System Lands.
7. Use only gravel, fill, sand, and rock that are judged to be weed free by District or Forest weed specialists.
8. Conduct road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants in consultation with District or Forest-level invasive plant specialists.
12. Develop a long-term site strategy for restoring/re-vegetating invasive plant sites prior to treatment (if invasive plant treatment is needed prior to project activities as a prevention measure).
13. Native plant materials are the first choice in re-vegetation for restoration and rehabilitation where timely natural regeneration of native plant community is not likely to occur.

Under the Region 6 ROD, these standards apply to the prevention and management of all invasive non-native species and not just those listed as "noxious weeds".

Wallowa-Whitman National Forest Invasive Species Plan

In 2010 the Wallowa-Whitman National Forest Invasive Species Plan ROD was signed. This decision authorized the treatment of invasive non-native species on specific sites on the forest. This decision created the ability to conduct Early Detection Rapid Response (EDRR) on newly discovered sites. The ability to respond to new spread or establishment of invasive non-native species has given the Forest Service a tool that should help reduce the spread and establishment of invasive species by about one-half of the previous rate.

Existing Condition

There are 68 inventoried invasive non-native plant sites (11 different species) within the East Face Project area. The inventoried acres within the project area are shown in the table below. Many sites are linear, lying along roads, and in several cases multiple species occur within a single location. Acreages reflect current information in the Forest Invasive Species (INSP) GIS layer (GIS query, December 12, 2014). In addition to these listed species the project area also includes Ventenata (*Ventenata dubia),* Cheat grass *(Bromus tectorum)*, and others that are potentially harmful invasive species but do not meet the requirement for listing on the state or county "noxious weed" lists.

Baker County and the Oregon Department of Agriculture (ODA) designate listed invasive species status using a similar system:

> "A" designated species – an invasive of known economic importance which occurs in the state in small enough infestations to make eradication or containment possible; or is not known to occur, but its presence in neighboring states makes future occurrence in Oregon seem imminent.

Recommended Action: Infestations are subject to intensive control when and where found by Union County with possible assistance from the Oregon Department of Agriculture.

"B" designated species – an invasive of economic importance which is regionally abundant, but which may have limited distribution in some counties.

Recommended Action: Moderate to intensive control at the county level.

ODA also has "T" designated species, which are a priority noxious weed designated by the Oregon State Weed Board for which the ODA will develop and implement a statewide management plan. "T" designated noxious weeds are species selected from either the state "A" or "B" lists.

Table 94 - Invasive Plant Inventory and Oregon Designations

Scientific Name	Common Name	Acres	County Designation	State Designation
Cardaria draba	white top	7.6	A	B
Centaurea diffusa	diffuse knapweed	101.9	A	B
Centaurea biebersteinii	spotted knapweed	0.4	A	B
Centaurea solstitialis	yellow star-thistle	4.5	A	B
Cirsium arvense	canada thistle	1134.8	B	B
Cynoglossum officinale	hounds tongue	1156.7	B	B
Hypericum perforatum	St. Johnswort	245.9	--	B
Onopordum acanthium	scotch thistle	2.6	A	B
Potentilla recta	sulfur cinquefoil	210	B	B
Senecio jacobaea	Tansy ragwort	2.5	A	B
	Total Acres	**2873**		

Treatment and monitoring records document all site visits by invasive plant specialists, spanning the years since initial discovery and inventory of the site. These records are on file at the La Grande and Whitman Ranger District Offices in La Grande and Baker City, Oregon. These sites are visited on a regular basis for treatment and monitoring and can be relocated and identified on the ground when necessary.

Effects

Analysis Methodology

The effects (expected and potential) were assessed using field surveys, literature documentation, documented site information, and professional judgment.

The boundary of the direct, indirect and cumulative effects analysis is the project area boundary. This area encompasses all areas of potential project activities.

Assumptions

The following are assumptions were utilized for analyzing the effects of implementing the alternatives in the East Face project.

- Invasive non-native species populations are increasing at a rate of 8-12% per year on public lands (USDA 2005).
- The record of decision for the Wallowa-Whitman National Forest Invasive Specie Management EIS and the adoption of the standards from the Region 6 ROD should slow the annual rate of spread and establishment of invasive non-native species by up to 50% annually (down to 4-6%) (USDA 2005, USDA 2010).
- Mitigations described earlier are implemented in full.
- Timeframes – the following timeframes were used to discuss the direct, indirect and cumulative effects of project implementation on invasive species related to the potential for establishment and spread of invasives:

  A. Potential for Establishment
  - **Short-term timeframe:** 1-3 years. This period of time would be long enough to notice the germination and growth of any new invasive non-native species after project activities.
  - **Long-term timeframe:** 25-30 years. This long term timeframe was chosen because climate change, unforeseeable future projects, demographic changes, etc., make assumptions beyond this timeframe speculative. Further, changes in the plant community dynamics would have been identified by this point and establishment of invasive non-native plants due to project activities would have occurred

  B. Potential for Spread
  - **Short-term timeframe:** 1-3 years. This period of time would be long enough to notice the increase in size of a known infestation, and allow for the rapid response to potentially contain that site after project activities.
  - **Long-term timeframe:** 25-30 years. This long term timeframe was chosen because climate change, unforeseeable future projects, demographic changes, etc., make assumptions beyond this timeframe speculative. Further, changes in the plant community dynamics would have been identified by this point and spread of invasive non-native plants would have been established.

Invasive non-native species are currently damaging the biological diversity and healthy native plant communities located both on and off national forest system (NFS) lands. The introduction and subsequent spread of invasive species can have a variety of environmental effects such as displacement of native species, reduction in suitable habitat, reduction in forage for livestock and wildlife, destruction of habitat and loss of threatened and endangered species (TES) species, increased soil erosion, water quality reduction, and significant reductions in soil productivity. The establishment and spread of non-native plants is a dynamic event that incorporates many diverse variables. Invasion theory, as it pertains to non-native species, contains three main principles: disturbance, propagule pressure, and competition (Hobbs & Huenneke 1992, Lockwood et al. 2005, Sutherland 2008).

Invasive species are quick to colonize an area of disturbance and can use their "weedy" life-history traits to establish within novel habitats. Disturbance such as fire, construction, mining operations, and commercial timber harvest can alter native plant communities and increase the chance of invasion by non-native species. Several factors such as type of disturbance, proximity to propagule source, and size or magnitude of disturbance can increase the propensity for invasion of an otherwise healthy plant community by non-natives.

The second factor in the invasion theory is propagule pressure. Propagule pressure is defined as the number of possible individuals (seeds, seedlings, etc.) released into a region in which they are not native and the number of such release events (Lockwood et al. 2005). In essence, the higher the propagule pressure (more seeds or more opportunities for a release) the greater the likelihood of a successful colonization. Many factors can lead to increased propagule pressure but the most likely cause is an increase in the number of release events. Many activities conducted on NFS lands can lead to an increase in the propagule pressure including fire, timber sales and salvage, road construction, use of heavy equipment, recreation, and grazing.

Finally, the last principle of invasion theory is competition. Even though the ability of an invasive to spread or colonize new sites is generally species dependent, all invasive non-natives are considered potential threats to native plant communities due to traits that make them good competitors for resources.

Table 95 - Effects of prescribed fire on specific invasive non-native plants found within the East Face Project Boundary (USDA Fire Effects Information)

Scientific/Common name	Timing	Effect
Cardaria draba/Whitetop	Spring	No effect on plant frequency or control
	Fall	No effect on plant frequency or control
Centaurea diffusa/Diffuse Knapweed	Spring	Increased in seasons following fire
	Fall	Doubled two years after fire
Hypercium perforatum/Common St. Johnswort	Spring	Quickly increased after fire
	Fall	Increased albeit at a lower rate than spring burning
Ventenata dubia/Ventenata	Spring	Unknown
	Fall	Unknown
Bromus tectorum/Cheatgrass	Spring	Little effect due to the difficulty in burning early in the season.
	Fall	Trend of increased seed production in the seasons following the fire
Cirsium arvense/Canada Thistle	Spring	Potential discouragement of growth during late spring burning
	Fall	Frequency of fire can affect the growth of this and other thistles
Potentilla recta/Sulfur Cinquefoil	Spring	Plant density increased more slowly but was higher after 5 years
	Fall	Plant density was higher than spring burns 1 year after fire but lower after 5 years
Cynoglossum officinale/Hounds tongue	Spring	May be favored in a post fire community
	Fall	May be favored in a post fire community
Senecio jacobaea/Tansy ragwort	Spring	Unknown
	Fall	Unknown
Centaurea biebersteinii/Spotted knapweed	Spring	Increases spread
	Fall	Greater increased spread potential
Onopordum acanthium/Scotch thistle	Spring	Unknown
	Fall	Unknown

Methodology

Throughout this document, the potential for each of the proposed activities to increase the establishment and spread of invasive species is described using the following qualitative scale:

- NO – Project activities have no potential to introduce or spread invasive species.

- LOW – Activities identified as low would create little to no bare soils and have extremely limited potential for the introduction of invasive plant material to the project area. If left untreated, invasive species within these areas would not spread from current locations or expand from current levels at rates higher than those found in the absence of project activities.
- MODERATE – Moderate level activities are those that, with recommended mitigation could be treated and reduced to pre-project levels, but without the implementation of these measures could begin to spread beyond current levels.
- HIGH - A high level activity is one that is very likely to create opportunities for the spread and introduction of invasive species which could not be mitigated with prevention measures. To control a population of invasive species established under high intensity activities would likely require an increase in invasive treatment activities (including herbicide use) and funding in order to control the infestation.

In order to analyze the effects of project activities on the potential establishment or spread of invasive non-native species, a qualitative estimate for the potential of the impact has been established for each action. They are based on the amount of ground disturbance proposed, the likelihood of spread of an existing site or new sites being established and the proximity of current invasive non-native species sites. An activity with little new ground disturbance and no known invasive non-native plants in the vicinity would be rated as having a low potential for invasive species establishment while an area that proposes large scale ground disturbance with invasive non-native plants nearby might be rated as a high. Likewise, if an activity would create little to no ground disturbance and there are no known invasive non-native species infestations nearby it would be rated as a "No" potential for spread while activities that propose large scale new ground disturbance with invasive non-native plants on site might be rated as having a high potential for spread.

Measurement Indicators

The following two indicators will be used to analyze the effects of implementing the alternatives on invasive species. Differences between alternatives will be displayed by comparing the potential change in the indicators from the existing conditions.

A. Potential for Establishment of Invasive Species

While direct/indirect effects on the potential establishment of non-native plants are difficult to predict and quantify, they would occur through ground disturbance and introduction of invaders into new areas. Disturbance is defined as a punctuated event or series of events that kill or damage existing organisms, directly or in-directly increase resource availability, and create an opportunity for new individuals to become established (Sousa 1984). Disturbance associated with vegetation management activities are expected through movement of heavy equipment, soil displacement, and vegetation compression; but the amount of disturbance can vary depending on activity density and type. Project activities can introduce new species into areas by transporting non-native plant material on machinery or personnel. Increased disturbance and access would increase the potential for new establishment of invasive non-native species in sites previously unoccupied. Wildfire suppression would also have the potential to increase the risk of establishment of invasive non-native species, but predicting wildfire occurrence is problematic.

B. Potential for the Spread of Invasive Species

The potential spread of non-native plants is also difficult to predict and quantify; however, it would occur through ground disturbance and the possible increase in “invisibility” or reduction in competition from native species after disturbance. Increased disturbance and pre-existing invasive non-native sites in the vicinity of project activities would increase the potential for spread of invasive non-native species. Wildfire and the activity involved in suppression would also increase the risk of spread of invasive non-native species, but predicting wildfire occurrence is problematic. Large scale and intense wildfire disturbance would create ideal areas for the introduction and spread of non-native plants. With increasing numbers of wildfires the numbers of non-native species could increase (Merriam, et al., 2006), with the largest increases found in those areas with pre-existing non-native plant populations.

No Direct, Indirect, or Cumulative Effects

The following activities in the action alternatives would have a negligible potential to effect the establishment and spread of invasive species:

- Danger tree removal
- Helicopter yarding
- Whitebark Pine Treatments
- Precommercial thinning with no follow-up mechanical fuels treatments or biomass removal
- Whipfelling by hand with no follow-up mechanical fuels treatments
- Hand treatments within RHCAs
- Snag Retention

These activities will not be discussed further in this analysis.

Direct and Indirect Effects on Invasive Species

Five alternatives are being analyzed for this project to determine the magnitude of direct, indirect and cumulative effects on invasive non-native species. The desired outcome of the East Face project is reduced surface fuel loadings, ladder fuels, and canopy bulk densities in strategic locations throughout the project area. The action alternatives in the East Face Vegetation Management Project consist of vegetation treatments including commercial harvest, non-commercial thinning, and associated fuels treatments such as grapple pile, hand pile, and prescribed fire. The action alternatives also include temporary road construction, road reconstruction, road maintenance, and the replacement of a culvert and a bridge. In the short term, the activities of the action alternatives would cause soil disturbance and alter the canopy cover which would create opportunities for invasive plants to establish and spread.

ALTERNATIVE 1

No project activities (including commercial thinning and prescribed burning) would be authorized under this alternative. All inventoried invasive sites would continue to be managed in accordance with the Wallowa-Whitman Invasive Plant Program EIS (USDA 2010) and the Wallowa-Whitman Forest Plan as amended by Regional Forester Amendment #5 that incorporates the Pacific Northwest Region Preventing and Managing Invasive Plants Record of Decision (USDA 2005).

A. Potential for Establishment

There would be no direct effects to the establishment potential of invasive non-native species because no project activities (ex. Harvest, thinning, and prescribed fire) would be authorized. Many vectors for the establishment of new populations would still exist with recreation and vehicle travel, livestock and big game transport, and others. Over time, with no additional disturbances to known sites, further treatment success, and no reduction to existing desirable vegetation cover and vigor the known sites could be eradicated or significantly reduced.

However, without project activities that are designed to reduce fuel loading within the project area, indirect effects may exist due to the increased risk of large-scale wildfire. With an increase in wildfire potential, there would be an increase in the amount of suppression activity which could increase the risk of establishment of new invasive species and sites within the project area. Transport of non-native species seeds and material can occur through the movement of personnel and equipment from an infested area to an un-infested area. The potential for this impact would be **Low** due to mitigations and requirements associated with fire suppression activities. Weed-wash stations and the presence of resource advisors that guide suppression activity could reduce this risk further and minimize the possibility of invasive species material transport into previously un-infested areas.

B. Potential for Spread

There would also be no direct effects to the spread potential of invasive non-native species because no project activities would be authorized. Many vectors for the spread of known populations would still exist with recreation and vehicle travel, livestock and big game transport, and others. In the long-term, with no additional disturbances to known sites, further treatment success, and no reduction to existing desirable vegetation cover and vigor the known sites could be eradicated or significantly reduced.

However, without project activities that are designed to reduce fuel loading within the project area, increased risk of large-scale wildfire would continue. With an increase in wildfire potential, there could be an increase in ground disturbance from the fire and the associated suppression activity that would create ideal situations for the spread of current invasive species sites. Further, the increase in suppression activities and the movement of personnel and equipment through existing non-native species sites could allow for an increased rate of spread. Therefore, the potential for this impact would be **Moderate** due to the increased fuel loading in the long-term which could increase the potentiality of a high intensity fire in the future.

Action Alternatives

The following tables summarize the effects of implementing the actions proposed in each of the action alternatives and the potential intensity of those effects.

Table 96 - Element specific effects of action alternatives

Alternative Elements	Potential Effects	Rationale		
Commercial Harvest Treatments	Ground disturbance and introduction of plant materials on people and vehicles	-This activity generally includes hand/saw work and machinery. The possibility of larger scale disturbance associated with harvest can increase the risk of non-native plant introduction and spread. The increase in traffic along haul routes can also compound the risk of introduction or movement of unwanted plant material. -Regional ROD Standards 2 and 3 would reduce the risk associated with this element, but not enough to change the intensity from “Moderate” to “Low”.		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	6,722 acres	3,879 acres	2,844 acres	10,221 acres
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Noncommercial Fuels Reduction Mechanical (WFM, FFU)	Ground disturbance and introduction of plant materials on people and machinery. Reduced canopy.	The use of slash busters and other machines increases the possibility for ground disturbance as well as introduction of new plant material. Decrease in canopy cover decreases competition and provides increased opportunities for invasive plant establishment. -Mitigation measures and Regional ROD standard 2 would further reduce the risk involved with this activity element.		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	1,745	1,745	1,790	1,745
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Post Treatment Activities Mechanical Grapple Pile/ Landing Pile Burning	Ground disturbance and introduction of plant materials on people and machinery. Grapple piles create large diameter burn scars for invasive plants to establish.	The use of slash busters and excavators increases the possibility for ground disturbance as well as introduction of new plant material. - Mitigation measures and Regional ROD standard 2 would further reduce the risk involved with this activity element.		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	10,704 acres	6,842 acres	8,568 acres	8,083 acres
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Post Treatment Fuels Blocks – Prescribed Burning	Increase in disturbance, available resources, and short-term reduction in competition.	-Prescribed burning has the potential to increase disturbance thus favoring invasive non-native plants. The short-term reduction in fuels may also reduce competition of native plants allowing increased spread. -The degree of disturbance from burning could, depending on timing, reduce the cover of existing invasive plants and retard seed set. Burning occurring in the summer can be beneficial when conducted in conjunction with ongoing invasive species treatment, but burning in the spring and fall are generally not adept at controlling invasive plant sites. - Mitigations measures would reduce the effect intensity from “Moderate” to “Low”		

Alternative Elements	Potential Effects	Rationale		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	6,685 acres	6,043 acres	6,643 acres	6,685 acres
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Yarding Systems (Ground Based and Skyline)	Ground disturbance and introduction of plant material	-Mechanical aids to harvest increase the level of ground disturbance by producing skid trails and other bare ground areas. The possibility of creating conditions favoring invasive plant introduction is increased with this type of activity. Movement of plant material to new areas is also a risk. -Regional ROD standards 3, 12, and 13 would reduce these effects.		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	6,389 acres	3,655 acres	2,511 acres	9,800 acres
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Roads (closed system roads opened temporarily)	Ground disturbance and introduction of plant materials on people, machinery, and vehicles	-Road use creates situations that favor the spread of invasive plants by disturbing roadsides and carrying seeds to non-infested areas. Re-opening of roads can allow for the spread of invasive non-native plants to previously non-infested areas. - Mitigation measures and Regional ROD standards 2, 3, 7, and 8 would help moderate the risk associated with this activity element, but would not reduce the intensity of that risk		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	107 miles	66.9 miles	38.6 miles	122.7 miles
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Roads (temporary roads created or existing non-system roads)	Ground disturbance and introduction of plant materials on people, machinery, and vehicles	-Road use creates situations that favor the spread of invasive plants by disturbing roadsides and carrying seeds to non-infested areas. Re-opening of roads can allow for the spread of invasive non-native plants to previously non-infested areas. -Mitigation measures and Regional ROD standards 2, 3, 7, and 8 would help moderate the risk associated with this activity element, but would not reduce the intensity of that risk		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	25.24 miles	0 miles	5.24 miles	29.42 miles
*Potential for Effect	Moderate	No	Moderate	Moderate

Alternative Elements	Potential Effects	Rationale		
Roads (Reconstruction)	Ground disturbance and introduction of plant materials on people, machinery, and vehicles	- Disturbance of road sides can allow for the spread of invasive non-native plants to previously non-infested areas. -Mitigation measures and Regional ROD standards 2, 3, 7, and 8 would help moderate the risk associated with this activity element, but would not reduce the intensity of that risk		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	53 miles	39.3 miles	27.8 miles	61.6 miles
*Potential for Effect	Moderate	Moderate	Moderate	Moderate
Culvert Replacement	Ground disturbance and introduction of plant materials on people, machinery, and vehicles	- Ground disturbance can allow for the spread of invasive non-native plants to previously non-infested areas. -Mitigation measures, and Regional ROD standards 2, 3, 7, and 8 would help moderate the risk associated with this activity element.		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	<0.1	<0.1	<0.1	<0.1
*Potential for Effect	Low	Low	Low	Low
Bridge Replacement	Ground disturbance and introduction of plant materials on people, machinery, and vehicles	- Ground disturbance can allow for the spread of invasive non-native plants to previously non-infested areas. -Mitigation measures and Regional ROD standards 2, 3, 7, and 8 would help moderate the risk associated with this activity element.		
Effects Comparison	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
*Treatment Acres	<1	<1	<1	<1
*Potential for Effect	Low	Low	Low	Low

All of the action alternatives have some amount of proposed treatment for each element except for temporary road activities for Alternative 3. For all other activities the comparison of the effects of the alternatives is essentially a comparison of the number of acres proposed for each element. There is an increased risk of potential effects associated with increased acres treated, but the differences among the alternatives are not enough to change the score on the qualitative scale used in the assessment.

While effects of fuels reduction/vegetation management projects on non-native species are difficult to predict and quantify, and may change depending on the duration of the activity and extent of the disturbance, certain associated activities may affect different species in different manners. For example, the effects of prescribed fire and pre-commercial thinning can vary depending on the specific technique and the timing of the activity. Prescribed burning can affect the invasive non-native plants differently (See Table 95) depending on the time of occurrence. Fall burning has been shown to increase (although not significantly) the number of native species, while spring burning tends towards a decrease in the number of non-natives (Potts & Stephens, 2009).

Effects of commercial and non-commercial thinning treatments also depend on the timing as well as the type of activity. Heavy equipment use has the greatest potential for disturbing soil and introducing plant material to an area, while low impact mechanical thinning by way of mastication has the least potential. However, timing of mastication activities appears to affect the response of non-native plants as spring thinning by mastication showed a decrease in non-native introductions when compared to similar activities in the fall. Timing of activities within this project should consider these variable effects.

Road activities (including use and construction of temporary roads) can create situations that favor the spread of invasive plants by disturbing roadsides and carrying seeds to un-infested areas. Use and construction of temporary roads can allow the easy spread of invasive non-native plants to previously un-infested areas. The risk associated with road activities and non-native species would increase as miles of temporary road use and construction increases. Exact estimates of this risk however, are unknown and difficult to predict.

ALTERNATIVES 2 and 5

A. Potential for Establishment

Direct effects to the establishment potential of invasive non-native species as a result of project activities would occur by the movement of invasive species materials on project personnel and equipment. As the number of acres of total treatment increases, the amount of personnel and equipment increases, thus the short-term risk of non-native species establishment also increases. As can be seen in Table 96, Alternatives 2 and 5 propose the most acres of harvest, noncommercial, and post treatment activities. All of these activities have a potential to increase the risk of introducing new invasive species. Alternative 5 proposes nearly 3,500 more acres of commercial harvest removal than Alternative 2 which makes the potential risk for non-native species establishment in Alternative 5 thirty percent greater than Alternative 2.

However, the decreased fuel loadings and subsequent reduced potential risk for large-scale wildfire that would result could reduce the need for suppression activities in the long-term indirectly reducing the opportunity for the transportation of non-native invasive species material and establishment of new invasive species and sites within the project area in the event of a wildfire. While more fuel reduction activities would occur under Alternative 5 than Alternative 2, potential large fire risk reduction would be similar for both of these alternatives.

The overall effect of the actions in these alternatives on the potential to establish invasive non-native species is estimated to be Moderate, due to the large number of acres of proposed mechanical activity with a short-term effect, being offset by the project mitigation measures and the fuels reduction work resulting in a subsequent decrease in wildfire risk in the long-term.

B. Potential for Spread

Direct effects to the spread potential of invasive non-native species due to project activities may occur due to movement of invasive species materials on project personnel and equipment and ground disturbance as a result of project activities. As the number of acres of total treatment (more potential disturbance and more movement of project equipment) and the total acres of non-native invasive species (more propagule pressure) increases; the risk of non-native species spread also increases. As described above, Alternatives 2 and 5 propose the most acres of total treatment (prescribed fire, non-commercial thinning, commercial treatment, and post treatment). They also propose the most acres of ground based and skyline yarding with totals of 6,389 acres (Alternative 2) and 9,800 acres (Alternative 5) and the most miles of road related activities (Table 96). All of these activities have a potential to increase the risk of spreading invasive species in the short-term beyond the current extent of known sites; however, implementation of the prevention mitigation measures such as pre-treatment of known infestations, avoiding active infestation sites, and machinery cleaning requirements should limit the potential for spread.

Fuel load reduction contributes to indirect effects in terms of a contributing to a potential reduction in the risk of spread. This benefit is due, in part, to the decreased fuel loading and reduced risk of large-scale wildfire in the long-term that would result from this vegetation management project. With a lowered risk of wildfire potential, there would be a decrease in the amount of potential ground disturbance from the fire and a decrease in suppression activity. These decreases would reduce the potential "invasibility" of the area due to wildfire activity and decrease the opportunity for the transportation of non-native invasive species material on personnel and equipment used for suppression activity. Thus, the spread of existing invasive species beyond their current extent would also be reduced.

The overall effect of the actions in these alternatives on the potential to spread invasive non-native species is estimated to be **Moderate**, due to the increased area of proposed activity and ground disturbance with a short-term effect being offset by the potential decrease in risk of large-scale wildfire in the long-term. However, the effects under alternative 5 would still be greater than those found under the Alternative 2 due to the increase in activity within the project area.

ALTERNATIVE 3

A. Potential for Establishment

This alternative for the East Face project consists of the same types of vegetation treatments as Alternative 2 but with fewer acres of commercial, non-commercial, post treatment activities, and ground and skyline based yarding. It also includes fewer miles of road work and proposes no temporary roads.

Direct effects to the establishment potential of invasive non-native species due to project activities would be similar to those found in Alternative 2; however, as Alternative 3 would impact 42% fewer acres with harvest equipment (see Table 96) than Alternative 2 the risk of non-native species establishment in the short-term is decreased. Further, this alternative does not propose any new temporary road construction so the risk of establishing new populations of invasive non-native species would be further reduced in the short-term from that described in Alternative 2.

The overall effect of the actions in this alternative on the potential to establish invasive non-native species is estimated to be **Moderate**, due to the increased area of proposed activity but the potential decrease in risk of large-scale wildfire. However, the effects under Alternative 3 would still be less than that found under Alternatives 2, 4, and 5 due to the reduction in activity within the project area, and (while less than the other action alternatives) would still reduce fuels and thus the risk of wildfire in the long-term.

B. Potential for Spread

As discussed under the potential for establishment above, direct effects of this alternative on the spread potential of invasive non-native species due to project activities would be similar to those found in Alternative 2. However, because the total number of treatment acres is less than Alternatives 2, 4, and 5 the short-term risk of potential non-native species spread is decreased. Further, since this alternative does not propose any temporary road construction the risk to invasive non-native species would be further reduced. For activity specific effect intensity and rationale see Table 96.

The overall effect of the actions in this alternative on the potential to establish invasive non-native species is estimated to be **Moderate**, due to the decreased area of proposed activity but the potential increase in long-term risk of large-scale wildfire. However, the potential effects under Alternative 3 would still be less than that found under Alternatives 2, 4, and 5 due to the reduction in ground disturbing activities within the project area, and would still reduce fuels and thus the risk of wildfire.

ALTERNATIVE 4

A. Potential for Establishment

Alternative 4 has the same types of vegetation treatments as the other alternatives and treats nearly the same number of acres as Alternative 2; however, it proposes to treat 58% fewer acres with a commercial harvest treatment changing many of those treatments (32%) over to a noncommercial treatment prescription. Ramifications of these differences are; significantly fewer acres of ground based/skyline yarding, fewer acres of post-treatment activities, and fewer miles of road work. However, the total acres of combined harvest and noncommercial treatment activities are only 3% less than Alternative 2.

Direct effects to the establishment potential of invasive non-native species due to project activities would be similar to those found in Alternative 2. However, as the number of acres of commercial harvest treatment and subsequent heavy equipment use is less under Alternative 3 (see Table 96), the potential short-term risk for non-native species establishment due to disturbance associated with yarding and post treatment is cut nearly in half.

The overall effect of the actions in these alternatives on the potential to spread invasive non-native species is estimated to be **Moderate**, due to the increased area of proposed activity and ground disturbance being offset by the potential decrease in long-term risk of large-scale wildfire. However, the effects under alternative 5 would still be greater than those found under the Alternative 2 due to the increase in activity within the project area.

The overall effect of the actions in these alternatives on the potential to establish invasive non-native species is estimated to be **Moderate**, due to the similar area of proposed activity resulting in the reduction of canopy cover. However, the effects of Alternative 4 would still be less than those under Alternative 2 due to the 58% reduction in potential ground disturbance associated with harvest activities within the project area. Also, the benefits of the reduction of fuel loading would be 17% greater than Alternative 3.

B. Potential for Spread

Direct effects of this alternative related to the spread potential of invasive non-native species due to project activities would be less than those found in Alternatives 2, 3, and 5 due to the decrease in the proposed miles of road work (temporary road construction, reconstruction, and closed roads to be re-opened). However, since there are similar treatment acres proposed and thus similar fuels reduction benefits, indirect effects from decreased risk of wildfire in the long-term would be the same as Alternatives 2, 3, and 5.

The overall effect of the actions in this alternative on the potential to establish invasive non-native species is estimated to be **Moderate** due to the decreased canopy cover caused by noncommercial treatments and the high number of post treatment acres. However, the direct effects potential for spread under Alternative 4 would be less than under Alternative 2 due to the 58% reduction in potential ground disturbing activities within the project area.

Cumulative Effects on Invasive Species

Cumulative effects are the sum of all past and present actions, and reasonably foreseeable future actions in combination with the activities proposed in the East Face project. Past activities are considered in the existing condition baseline for this project. Present and reasonably foreseeable future activities on Forest Service, BLM, and private lands are described in Appendix D of this EA. Based on the analysis in Appendix D, potential cumulative effects will only be discussed related to private land activities, wildlife enhancement, grazing, roads and trails, OHV use, special uses, and noxious weed management because they were determined to overlap in time and space and result in a measurable cumulative effect when considered in combination with the activities proposed in the East Face project.

ALTERNATIVE 1

There will be no direct/indirect effects to invasive non-native plants as a result of the no action alternative because project activities will not be authorized. All current conditions and trends will continue unchanged. Since there are no direct/indirect effects then there will be no cumulative effects.

ALTERNATIVES 2 - 5

There is a potential for weed seeds to be carried from private land which may not have an active invasive plant management program to locations within the project area.

Managing the timing and allowable motor vehicle use within closure areas would reduce the potential to spread invasive plant material on vehicles and personnel and reduce the ground disturbance from user created roads and trails. While Alternatives 2-4 retain the existing closure periods in the Indian-Gorham and Clear Creek cooperative closure areas which would reduce the potential for spread of invasive plant material during a short time frame in the fall; however, extending the closure periods in Alternative 5 in the East Face project to encompass all of the big game hunting seasons (including archery season) would manage vehicle traffic during the heaviest use period and reduce the potential for spread and introduction within these closure areas.

Cattle are vectors for invasive plant seeds. Opening up the forest with fuel reduction practices decreases forest canopy and creates seed beds through ground disturbance increasing the potential for cattle to access areas where vegetation previously blocked their access thus allowing the potential for them to transport noxious weed seeds into new areas and increase the spread of current infestations. More of this would happen in Alternatives 2, 4, and 5 than in Alternative 3.

Ongoing road maintenance creates situations that favor the spread of invasive plants by disturbing roadsides and can increase the establishment by carrying seeds to un-infested areas. Quite a few of the East Face activities will be occurring along the 73 road because it has been identified as a strategic fuel reduction corridor; there is a slight potential for invasive spread and introduction from machinery involved in the resurfacing work by logging equipment crossing over or through areas where new invasive plant material has been introduced during road work. All action alternatives have a similar potential for this to occur.

Implementation of a travel management plan managing cross-country travel and motor vehicle use on roads, trails, and areas would reduce the potential to spread invasive plant material on vehicles and personnel and reduce the ground disturbance from user created roads and trails. Designating roads, trails and areas has the potential to improve compliance with the East Face post sale road management plan because motor vehicles would be restricted to designated roads and trails. Limiting cross-country travel and motor vehicle use on non-designated roads would minimize the potential introduction and spread of noxious weeds and increase the effectiveness of the East Face post sale road management plan.

Unregulated use of off highway vehicles poses a risk to the spread and establishment of non-native species due to the movement of plant material on equipment and the ability to introduce these materials to random areas that are difficult to identify for treatment. Re-opening roads and opening up stands with fuel reduction treatments in the East Face project increases the potential for introduction and spread of invasive plant material into more areas. More of this would occur in Alternatives 2, 4, and 5 than in Alternative 3, although Alternative 4 would require the fewest miles of currently closed roads to be re-opened for project activities.

Maintenance and repair of most special use facilities can create situations that favor the establishment and spread of invasive plants by disturbing ground and carrying seeds to un-infested areas. Regional standards along with noxious weed requirements which are part of the special use permits would help to reduce the risk of this potential effect. East Face activities overlap many of these sites and would increase the potential for spread of invasive species populations.

As described under Alternative 1, noxious weed management would continue to occur under all alternatives in this project which would continue to reduce the extent and amount of invasive plant sites through active treatment and management throughout the project area. Monitoring and mitigation associated with the East Face project in combination with on-going noxious weed management will increase the effectiveness of noxious weed management under all action alternatives.

Generally, the risk of wildfire combined with unregulated travel, road use and grazing has the greatest chance for cumulative effects on non-native plants within the East Face project area but predicting wildfire occurrence is problematic. Large scale and intense wildfire disturbance would create ideal areas for the introduction and spread of non-native plants. With increasing numbers of wildfires the numbers of non-native species could increase in the long-term (Merriam, et al., 2006), with the largest increases found in those areas with pre-existing non-native plant populations. One benefit of this project is the decrease of current fuel loading and therefore the risks of uncontrolled high-intensity wildfire, so future large-scale burns should be reduced. This reduction may further decrease the risk for areas outside of the treatment area boundaries (Merriam, et al., 2006).

Summary of Effects

The effects found in the above analysis can manifest in a variety of ways depending on the alternative. Each alternative has its own risks and effects that would be expected from project activities.

As stated earlier, Alternative 1 would have no new direct effects due to project activities within the project boundary. The risk of a stand replacing wildfire is increased due to increased fuel loading, and the potential for invasive species spread and establishment would increase beyond the rate found naturally. This effect, plus continuing risks from other types of activities occurring in the analysis area, would favor the spread potential of invasive species within the project area (Table 97) to levels beyond that found without wildfire activity.

Table 97 - Summary of estimated effects for all alternatives in the East Face project

Est. Effect*	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Establishment Potential	1	3	2	2	4
Spread Potential	4	2	3	2	2

* Estimated effect is based on increases (from pre-project levels) in establishment and spread of invasive non-native species due to project level activities. Higher number equates to higher risk but is only used for comparison between alternatives and is not an estimate of the intensity of the effect.

Although risks are present with or without project activities, the danger of invasive species establishment due to project activities under the action alternatives is higher than the ‘no action’ alternative. The highest risk of establishment would be under Alternative 5 because it proposes the greatest amount of activities. Alternatives 3 and 4 propose the least amounts of ground disturbing activities while Alternative 2 proposes an amount somewhat in the middle of these. However, the potential to spread invasive non-native species under either of the action alternatives is likely less than under the no action. This is due in large part to the reduction in wildfire risk associated with the action alternatives (slightly more risk under Alternative 3 due to a smaller reduction in overall fuel loading). With implementation of project design features to reduce and control the introduction and spread of non-native species we can minimize the impacts that do exist. Specific mitigations and required standards would continue to reduce the chances of new introductions, establishment, and spread of invasive non-native plants and we could predict an establishment and spread rate at the upper end of the natural level or about 6-8% for any of the action alternatives.

Climate Change

The potential effects of climate change on invasive species are unclear. Studies have suggested that climate change could favor invasion by non-native plants, while others have found that some species may actually be reduced as a result of potential climate change effects (Bradley, et. al, 2009; Hellman, et. al, 2008). It is safe to assume however, that invasions by non-native species would still be a concern.

With the unknown extent of climate change and the potential effect on non-native species, it is difficult to analyze the effects of climate change on invasive species in the East Face project. However, it seems unlikely that the activities of this project when coupled with climate change would increase the risk of invasion of the East Face project area beyond that outlined in this report. Further, it is possible that the East Face project may actually reduce the likelihood of invasion through increases in the health of native plant communities by returning them to their historic range of variability. As stated, healthy native plant communities are generally more resistant to invasion by non-native plants.

Compliance with the Forest Plan and Other Direction

The Forest Plan (as amended by the 2005 Region 6 ROD, amendment RF #5) provides direction for the control of noxious weeds and other competing vegetation where such activities are not precluded by management area direction. The goals focus on maintaining or enhancing ecosystem function to provide for long-term integrity and productivity of biological communities, treatment of priority infestations, and monitoring the effects of all activities to reduce the impacts of non-native plants. The site specific treatment requirements are further amended by the Wallowa-Whitman National Forest Invasive Plant Treatment Program EIS (USDA, 2010). The East Face project is consistent with these goals by implementing the standards requiring emphasis of prevention of invasive plant introduction, requiring the use of weed-free materials (straw, mulch, gravel, fill sand, etc.), requiring the cleaning of all equipment prior to entering National Forest System lands, managing road maintenance activities in areas with high concentrations of noxious weeds and coordinating activities with pre-treatment, and requiring the use of native plant materials for rehabilitation and restoration work.

Range Management

Introduction

The description of rangeland resources, along with the analysis of the expected and potential effects for each alternative, was assessed using GIS analysis, field surveys and professional judgment.

Existing Condition

The boundaries for the East Face project lie primarily within portions of the Lobo and Indian-Crane S&G (vacant) allotments on the Whitman Ranger District. Neither allotment has a current allotment management plan (AMP).

Table 98 - Allotments within the East Face project area

Allotment	Type	Total Allotment acres	Allotment acres within the East Face Project area	Allotment Season of use
Lobo	Cattle	16,527	15,664	6/15-10/15
Indian Crane	Sheep	42,972	20,712	vacant

Lobo C&H Allotment

The 16,527 acre Lobo cattle allotment is active and is permitted for 165 cow/calf pairs from 6/15-9/15. The allotment is managed using a three pasture deferred grazing system and the use of herding , salt and developed water sources to maintain appropriate livestock distribution.

See the annual operating instructions (AOI's) for the current rotation plan and specific standards and objectives. The entire allotment lies within the boundaries of the East Face project.

Indian-Crane S&G Allotment

The 42,972 acre Indian-Crane sheep allotment is vacant and not permitted for any livestock grazing. It was last grazed in 1983 with 1,000 ewe/lamb units. There are no known infrastructure investments within the allotment boundary; however portions of the East Face project border private land fences that must be protected during harvest activities.

Forest and Rangeland Vegetation

The soils within the project area are generally Columbia River basalts covered in many locations with volcanic ash cap deposits. This ash cap continues over decomposed granitic soils in the southern portion of the project area. These ashy soils are commonly the most productive growing sites for forest vegetation (Fryxell, 1965). Forest vegetation includes open and closed mixed conifer stands, upland shrubs, dry meadows, moist meadows and areas of conifer regeneration. Conifer stands are interspersed with rocky, grass covered slopes; dry meadows; and moist meadows usually associated with a riparian area. Forestlands are defined as those areas with at least 10% canopy cover.

Dominant plant communities within the forested type include Douglas-fir/snowberry, ponderosa pine/Idaho fescue, grand-fir/big huckleberry, subalpine fir/grouse huckleberry with a variety of shrubs and grasses intermixed depending on the soil type, aspect, and density of the forest canopy.

Riparian plant communities are generally Douglas-fir-Common Snowberry, Grand-fir-Common Snowberry and Mountain Alder-Currant/Mesic Forb.

Past timber harvest activities included post-harvest seeding with non-native perennial grasses, which are still present today. The area also supports isolated areas of annual grasses.

Where limited or no canopy exists, rangeland types are predominately shrub-grassland plant communities and include species such as snowberry, bluebunch wheatgrass, Idaho fescue, blue wild rye, Sandberg's bluegrass, prairie Junegrass, and onespike oatgrass and a variety of forbs such as mountain pea, lupine, yarrow, and arrowleaf balsamroot. Small areas of curl-leaf mountain mahogany are also found on rocky south facing slopes. Small moist to wet meadow areas are found with a variety of sedge and aquatic forbs plant composition.

The project area has been and continues to be grazed by wild ungulates (elk and mule deer). Many portions of the project area have been grazed by domestic livestock since the early 1900's. Effects from livestock can be similar to those of wildlife. While some effects of livestock grazing are considered acceptable and/or desirable, concentrated use or use that occurs in the same areas year after year can have undesirable effects.

The East Face project area has small to medium sized (10-500 acres) stands of rangeland vegetation within much larger expanses of forested landscapes, primarily Ponderosa pine and grand fir/ mixed conifer overstory vegetation.

Transitory Rangeland

Many areas within the project area have experienced past timber harvest, most recently in the late 20th century. This harvest allowed for the development of transitory rangeland where forage grasses and shrubs became established in areas that had previously been under closed forest canopy.

Transitory range is defined as “forested lands that are suitable for grazing for a limited time following a complete or partial forest removal” (Spreitzer 1985). The increased forage production made available as a result of past forest management that reduced overstory shading, has allowed for distribution of ungulates over a larger area within the project boundaries (Hedrick D.W. 1975). The forage produced following development of transitory range is highly variable depending on site conditions.

Transitory forest range is temporary and becomes less productive as the trees regenerate. Forage production for ungulates can be expected to peak from a few years to perhaps 20-30 years after logging. Grass and forb production peaks earlier than shrub production (Bedunah and Willard, 1987).

Through tree regeneration, this condition has been gradually reverting back to a closed canopy forest and resulting in reduced forage production over these portions of the East Face project area.

Proposed vegetation management and prescribed burning would allow retention of understory vegetation released during forest thinning projects. Many of the mixed conifer stands within the project area are outside the historic level of canopy closure expected in a stand where natural fire cycles would have reduced stems per acre and allowed for full canopy closure, precluding maintenance of understory grasses and shrubs.

Effects

Assumptions

The direct, indirect, and cumulative effects analysis area for rangeland resources is the project area boundary for this project.

Land management activities such as timber harvest, precommercial thinning, and prescribed burning would result in a return to more historic conditions for most treated units where canopy closure was has reduced the forage production of understory vegetation. A study in Montana found that reducing canopy closure to less than 50% results in a proportional increase in forage production until canopy closure has been reduced to 10-20% (Kolb, 1999). Kolb also suggested that decreased canopy closure also increases the effective precipitation reaching understory plants. Thinned stands of trees tend to collect snow, increasing the spring water supply to an area as much as 100%.

Historically, overstory removal developed areas of transitory range which increased the forage available to be used by wild ungulates. Changes in forest management and long term fire suppression activity have likely resulted in the loss of any transitory rangeland that was created in the 1960’s-1980’s as the effective improvements in forage production are diminishing after 30 years (Bedunah and Willard, 1987). A return to active management and reintroduction of prescribed fire allows for a return to more historic conditions that would carry forward in time. The combination of reducing fuel loads, reducing conifer encroachment in open meadows and opening canopies increases understory vegetation, and therefore, improves forage quantity and quality for wild forage allowing for improved herbivore distribution within the project area.

Bunchgrasses normally respond to burning with improved vigor which attracts an increase in domestic and wild ungulates use (Johnson 1998). Limitations on the amount of available forage burned per year minimizes the amount of available forage which may be negatively impacted by wild ungulate grazing which could result in a decline in forage condition or delay in recovery for forage in the burned area.

No Direct, Indirect, or Cumulative Effects on Rangeland Resources

The following activities associated with the East Face project have been analyzed and are of such limited context and constrained nature that they would have little to no measurable effect on rangeland resources.

- OFMS restoration to OFSS
- Snag Retention
- Temporary Road Construction
- Closed Roads re-opened for Administrative Access
- Roadside Hazard Tree Removal
- Mitigation Measures
- Whitebark Pine treatments
- Treating in MA15
- Treating in MA6

These activities and their effects will not be discussed further in the Range Resources section.

Direct and Indirect Effects on Rangeland Resources

ALTERNATIVE 1

This is the no action alternative, which means that all actions authorized by current management plans, permits, easements, and contracts would continue. Authorized actions on National Forest lands in the project area include agency actions, such as road maintenance and noxious weed treatments, and public actions such as fuel-wood removal, mining, and various types of recreation.

All current vegetative plant conditions would continue to exist, with some conditions improving, others remaining static, and still others deteriorating over time. Plus some new impacts are likely to occur from the above listed ongoing activities.

The lack of implementation of the action alternatives would over time increase the likelihood of declining forest health associated with overstocked stands and insect infestations. The continued loss of understory vegetation as a result of canopy closure in areas where lack of wildfire and stand re-initiation following past harvest activities, would continue until unmanaged wildfire or insect infestations change this condition.

ALTERNATIVES 2, 3, 4 and 5

The action alternatives differ in several ways based on treatment type and acres treated. The direct and indirect effect on rangeland resources does not significantly vary other than acres treated. The resulting reduction in canopy closure following treatment within each unit will allow an increase in herbaceous and shrubby vegetation for 10-20 years until tree regeneration converts treated stands back to a closed canopy arrangement. Follow-up maintenance burns would retard this process and allow for improved forage availability for wildlife and domestic ungulates. Table 99 describes the acres within the East Face project where vegetative treatment will occur. These treatment acres will show an increase in understory vegetation following completion, providing additional forage resources for wildlife and permitted livestock. Table 5 and 6 describe the acres by allotment where treatment will occur.

Table 99 - Treatment comparison for East Face project by acre

Treatment Type	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Commercial	6,722	3,879	2,844	10,221 (includes 2,560 acres biomass removal)
Non-Commercial Mechanical	6,929	6,403	6,884	6,538
Non-commercial hand treatment	3,347	3,372	6,682 90 (FFU)	1,277
Biomass Removal	0	0	0	2,560
Prescribed Fire	6,685	6,043	6,643	6,685

Table 100 - Total mechanical and non-mechanical treatment acres within the Lobo and Indian-Crane allotments by alternative

Allotment	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Lobo	5,621	4,677	5,500	6,043
Indian-Crane	6,544	5,184	6,131	7,042

Table 101 - Prescribe fire acres within the Lobo and Indian-Crane allotments by alternative

Allotment	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Lobo	3,520	3,329	3,520	3,520
Indian-Crane	2,653	2,541	2,646	2,653

Alternative Comparison Summary –

Each action alternative treats the vegetation in similar fashion resulting in improved potential for development of forage that may be utilized by wildlife and livestock. Alternative 5 treats the largest number of acres and will result in the greatest change in potential vegetative development whereas Alternative 3 treats the least. This difference of 1,366 acres across the active Lobo allotment may contribute to improved forage production and livestock distribution for 5-20 years following harvest over the other action alternatives.

Acres treated with prescribed fire are similar throughout the alternatives and have no measureable differences.

Commercial and Non-Commercial Timber Harvest/ Commercial Biomass Removal (HFU, HTH, HIM, HPO, HSH, HSA) include logging systems (tractor, skyline, helicopter)

Direct effects due to biomass removal include disturbance to wild ungulates during harvest activities, hazards created by wild ungulates on roads during log haul and other related activities. Disturbance to rangeland plants and soils may occur if landings are placed in sensitive areas such as scabs or moist meadows. Equipment use in conditions with wet soils may result in soil compaction and loss of soil productivity and recruitment/retention of desirable native vegetation. Indirect effects are an increase in transitory rangeland and improved access for wild ungulates into areas where down wood has accumulated due to lack of fire.

Alternative 5 would result in more potential acres available for transitory rangeland conversion followed by Alternatives 2, 4, and 3. Transitory range is defined as “forested lands that are suitable for grazing for a limited time following a complete or partial forest removal” (Spreitzer 1985). Increased forage production made available as a result of forest management that reduces overstory shading, (Hedrick D.W. 1975) will allow for distribution of wild ungulates over a larger area within the allotment boundaries. The forage produced following development of transitory range is highly variable depending on site conditions. Transitory forest range is temporary and becomes less productive as the trees regenerate. Forage production for wild ungulates can be expected to peak from a few years to perhaps 20-30 years after removal. Grass and forb production peaks earlier than shrub production (Bedunah and Willard, 1987).

Pre-Commercial Thinning without Harvest

Direct effects due to thinning within would be a reduction of wild ungulates access to thinned areas due to debris left on the site until the thinned material decomposes. Units where piling of thinned material is conducted would allow ungulates to access areas where dense small diameter vegetation has been the limiting factor. Units where mechanical thinning (slashbuster) devices area used would create mulch on the ground surface. Wild ungulates access through these areas would not be limited or reduced by slash. Domestic ungulates tend to avoid areas following pre-commercial thinning until the slash has been reduced in height by snow loading.

These areas would be used as transitory rangeland and show an increase in understory vegetative growth as a result of the reduced canopy closure. Hand thinning does not create disturbance to herbaceous forage in the way that mechanical equipment would. Pre-commercial thinning would indirectly allow increased sunlight and allow improved photosynthetic activity in areas where canopy closure has occurred. This would allow for increases in vegetative growth and possible improvement in plant diversity.

Post-harvest Treatment/Non-Commercial fuels reduction work mechanical and hand (grapple piling, slashbusting, hand piling, whipfelling, burning (prescribed and site preparation), precommercial thinning, planting)

Post-harvest treatments are designed to bring surface fuels loads and pre-commercial sized trees to desired levels. Units with heavy surface fuel loadings (fir dominated stands) usually be treated by slashbuster (mastication) or whipfell/grapple pile post-harvest treatment with RX burn several years (5-10 years) after mechanical treatment. Harvest units with light surface fuel loading/low density pre-commercial thinning would receive a whipfell and RX burn within 2-3 years after the whipfelling. Direct effects of mastication treatment will include increased access for wild ungulates to areas where dense understory vegetation precluded free access. Reduced understory competition and reduced canopy closure would allow for increased forage production on those stands where sunlight and soil resources had otherwise been intercepted by dense conifer stands.

Prescribed Fire

Direct effects from the implementation of the proposed action include an immediate reduction in available forage where burning occurs. This would be short term (1 year) until the following growing season. This reduction can span up to two years but is expected to return within 3-5 years if grazed conservatively (Valentine 1989). If prescribed fire is implemented during the normal grazing season some displacement of domestic ungulates is expected.

Snowberry and huckleberry understory shrub-lands would benefit from prescribed fire and show increased crown density for 3-7 years post treatment (USDA, GTR INT-239). Higher severity burns may damage below ground rhizomes and reduce sprouting (Hansen et al, 1988) however snowberry and huckleberry is generally resistant to even severe burns.

Proposed prescribed burning and future maintenance burns would allow retention of understory vegetation released during forest thinning projects. Many of the mixed conifer stands within the project area are outside the historic level of canopy closure expected in a stand where natural fire cycles would have reduced stems per acre and allowed for full canopy closure, precluding maintenance of understory grasses and shrubs.

Mechanical Control lines for Burning

Direct effects due to creating mechanical fireline within the project area would be a potential increase in domestic and wild ungulates use of the new trail. Temporary fireline that are closed immediately following use would not be used by wild ungulates if slash is placed on the surface. There would be no measurable effect on rangeland resources following fireline construction activities.

Hand Treatment within RHCAs

Direct effects due to thinning within RHCAs would be to initially reduce wild ungulates access to the stream corridor. Hand thinning does not create disturbance to herbaceous forage in the way that mechanical equipment would. RHCA thinning would indirectly allow increased sunlight and allow improved photosynthetic activity in areas where canopy closure has occurred. This would allow for increases in vegetative growth and possible improvement in plant diversity.

Connective Corridors

Connective corridors are untreated areas or areas with higher canopy closure and stocking levels where wildlife movement can be better accommodated between differing habitats. Left untreated, overstory vegetation will continue to move the stands to a closed canopy condition where forage production decreases. This indirectly reduces potential distribution opportunities for livestock and decreases over time browse based forage for wildlife.

Road Decommissioning

Direct effects due to road decommissioning will be reduction of travel routes utilized by livestock and permittees to access portions of the Lobo allotment. The roads proposed for decommissioning are scattered across the landscape and some are used occasionally for access to manage livestock and maintain structural improvements. Indirect effects of road decommissioning will be an increase in native vegetation due to increases in soil productivity following decommissioning.

Cumulative Effects on Rangeland Resources

Potential cumulative effects are analyzed by considering the proposed activities in the context of past, present and reasonably foreseeable actions. These are the areas where cumulative effects have occurred or may occur. Activities which occurred in the past have been incorporated into the existing condition of the project area. A summary table of the present and reasonably foreseeable future management activities in the cumulative effects analysis area is located in Appendix D of the analysis and has been used to assess the cumulative effects of implementing this project on rangeland resources.

For the purpose of this analysis, the cumulative effects are limited to the extent of the project boundary.

Alternative 1

Because there are no activities to overlap in time and space with this alternative there are no cumulative effects from this alternative to rangeland and grazing resources.

Alternatives 2, 3, 4 and 5

The only reasonably foreseeable future action which would overlap in time and space within this project area which may have a potential to have a long term affect to rangeland resources is Noxious Weed treatment. This project focuses on invasive non-native vegetation treatment to reduce impacts to native vegetation and soil resources. Reducing or preventing establishment of invasive species will allow native plants to maintain dominance, providing forage for native species, cover for migratory birds and small mammals, and protect soil from surface erosion.

No other present or reasonably foreseeable future activities would overlap in time and space with the project area, nor would they have a measureable cumulative effect on rangeland resources.

Access and Travel Management

Introduction

This analysis addresses roads currently listed in the Forest's transportation atlas. Unauthorized roads were not inventoried, nor specifically addressed. The East Face project area boundary is the analysis area for the following access and travel management discussions.

Existing Condition

Roads

There are approximately 364 miles of NFSR in the East Face project area. Of these miles, 127 miles are managed as open (Operational Maintenance Level 2 through Operational Maintenance Level 5), and 237 miles are managed as closed (ML1). Of particular note is that approximately 13 miles of the Elkhorn Drive State Scenic Byway traverses the southern edge of the analysis area boundary. This road is a double-lane, paved road which has a variety of RV, truck, passenger car, and tourist traffic year round.

There are also an extensive number of non-system roads which appear across the landscape from a variety of methods: firewood cutting, private land access, fire suppression trails/dozer lines, and old, temporary logging spurs being the predominant reasons. These road prisms exist in a variety of conditions, ranging from barely discernable, to primitive wheel tracks to full-bench construction. The system roads in the project area also exist in a variety of conditions. Some are passable with no work needed, while some need a significant amount of road work to become passable to even high clearance vehicular traffic. Currently, in the Forest's INFRA database, there is over $1 million in deferred maintenance in the East Face analysis area. Some road prisms are still visible from old roads which were decommissioned several decades ago. Although there is an inventory of decommissioned roads, a total inventory of these non-system roads has not been completed.

There is one bridge located on NFSR 7312 that is considered structurally deficient, and currently has a load rating of 10 tons placed on it. This means that commercial haul and generally any type of large truck traffic (empty or loaded) would not be permitted to haul across it without some form of bridge reconstruction or replacement. This bridge is located at the crossing of the North Fork of Anthony Creek.

The following table displays the number of roads located in the subwatersheds (6th field HUC) in the analysis area by operational maintenance level (ML). Operational maintenance level is defined as "the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns. It defines the level to which the road is currently being maintained. (FSH 7709.59, 62.31). In general, the lower the maintenance level, the less often a road will be maintained, and there is less concern with the road traveler's comfort. For example, ML1 roads are generally closed to vehicular traffic (by barrier or promulgation) and only receive maintenance during periods of use. These roads are often considered to be placed in storage. ML5 roads are maintained on a more frequent interval, and the traveler's safety and comfort is a high priority for scheduling maintenance activities. On the Wallowa-Whitman, these ML5 roads are generally paved and double-lane.

Table 102 - General NFS Roads Information in the East Face Project Area

Subwatershed	Size (Square Miles)	Miles Open Road (Operational ML 2-5)	Miles of Closed Road (Operational ML 1)	Total Miles of NFS Road
Lower Anthony Creek	13.34	15.62	49.92	65.54
Lower North Powder River	0.10	0.00	0.21	0.21
Middle North Powder River	6.71	18.36	23.56	41.92
Tanner Gulch-Grande Ronde River	0.82	4.22	0.09	4.31
Upper Anthony Creek	22.33	25.67	42.10	67.77
Upper Beaver Creek	5.32	9.91	18.03	27.94
Upper Ladd Creek	2.25	10.97	5.51	16.48
Upper Wolf Creek	21.63	42.04	97.65	139.69

The table above does not include miles of private, state, or county owned roads. There are very small slivers of Baldy Creek and Jordan Creek subwatersheds that are not included, as they round to 0.00 mi/mi^2 in size.

There are generally four NFSR routes out of the East Face project area that lead toward Interstate 84. These routes are Road 43 at the far north and west sides of the project, Roads 4315 and 4330 in the interior portion of the project, and Road 73 at the south end of the project. Additionally, collector routes 4316, 4320, 4350, 4380, 7302, 7307 and 7312 will provide internal connections between these routes. These routes are all open roads and experience recreational traffic year round.

Most of the roads in the East Face project area are closed; however, some of these roads are being used by OHVs, and some are being used by full-size vehicles. The 1990 Wallowa-Whitman Forest Land and Resource Management Plan (FLRMP) currently allows use of closed roads, stating it is acceptable to "permit all-terrain vehicle (ATV) use and over-the-snow use on blocked or closed roads unless this use is found to be incompatible with resource management objectives. These types of uses were considered to be an acceptable form of recreation except where site specific analysis shows them to be incompatible due to resource management problems" (1990 Forest Plan, pp. 4-36).

Past site specific analysis has determined that motor vehicle use in the area defined by the Clear Creek closure area, on the north side of the project, is seasonally restricted from 3 days prior to the opening of rifle bull elk season through the close of rifle bull elk season, except for routes designated as open. This restriction is also known as a 'green dot closure', as open routes during this closure period were signed on the ground with a green dot. In the Indian-Gorham closure area (located on the south portion of the project) all motor vehicle use is prohibited on Road 7315 and all of its tributary routes, for reasons tied to wildlife protection.

Haul

For commercial harvest operations, the nearest timber processor to the project is Boise Cascade in La Grande, Oregon; however, small diameter or biomass material could be taken to nearby North Powder, Oregon, or as far away as Parma, Idaho. It is estimated that about one-quarter of the commercial volume will haul northeast to NFSR 43 to Interstate 84, while another one-quarter of the volume would haul south on NFSRs 43, 7302 or 7312 (or north on NFSR 7307) to NFSR 73, to Baker County road 1146 and Union County road 101 to Interstate 84. The remainder of the volume would haul east on NFSR 4315 to Union County 104 or east on NFSR 4330 to Union County 102 and 101. From here, these roads connect to Interstate 84 near North Powder, and haul could travel north to La Grande, or southeast to Idaho.

Right of Way

The landlines in the project area are posted. There is private land located inside and adjacent to the project area, and there are several roads where right-of-way has been acquired. However, most of the roads on private land do not have right-of-way, so road use agreements will be needed for access to a few units. It is expected that any use of roads 4315952 or 4315954 would need an agreement between the Forest Service and the landowner in place prior to vegetation management activities taking place. For this project and long-term road system needs, right-of-way is being acquired in the form of an easement across approximately 0.5 miles of NFSR 7302 located in T7S, R 38E, Section 6 (Refer to maps in Appendix A).

Road Density

There are standards and guidelines referenced in Chapter 4 of the Wallowa-Whitman Forest Plan (FLRMP) for open road densities. These open road density guidelines specifically address open road densities in five management areas (MA). The five management areas are: MA1 (timber emphasis), MA1W (timber/wildlife emphasis), MA3/3A (big game winter/summer range), and MA18 (anadromous fish emphasis). For MA3, note that snow will effectively close most winter range areas to access by wheeled vehicles during the winter months, consequently, road closures more restrictive than those applied to MA1 will not normally be necessary" (FLRMP, pp. 4-63). The guidelines for management areas within the East Face project area are shown in table 103. A summary of the current road densities for the operational (existing) road system are summarized below:

Table 103 – Forest Plan Open Road Densities (ORD) for Existing Road System in East Face Project Area

SUBWATERSHED NAME	MA	Acres	Area in Sq Miles	Open Rd Miles	Open Rd Mile Density (mi/mi^2)	Forest Plan ORDs (mi/mi^2)
Lower Anthony Creek	1	7,820	12.22	9.55	**0.8**	2.5
	3	705	1.10	4.53	**4.1**	1.5
Middle North Powder River	1	3,656	5.71	15.03	**2.6**	2.5
	3	171	0.27	0.52	**2.0**	1.5
Tanner Gulch-Grande Ronde River	3A	219	0.34	2.61	**7.6**	1.5
Upper Anthony Creek	1	11,193	17.49	16.79	**1.0**	2.5
Upper Beaver Creek	3A	3,389	5.30	9.73	**1.8**	1.5
Upper Ladd Creek	1	1,439	2.25	10.98	**4.9**	2.5
Upper Wolf Creek	1	13,725	21.45	41.84	**2.0**	2.5
	3	103	0.16	0.02	**0.1**	1.5

Note: Miles shown are calculated from GIS. In areas where the square miles are less than 0.1 mi/mi^2, the road density has been rounded to zero. Subwatersheds where there are no road miles or relevant management areas (MAs with no FP open road density requirements) are not shown for clarity.

The management areas where the open road density appears high, is generally due to the fact the only a very small amount of acreage exists in the project area. The MA3 portion of Lower Anthony Creek subwatershed, the MA3 portion of Middle North Powder River, the MA3A portion of Tanner Gulch-Grande Ronde, and the MA3 portion of Upper Wolf Creek are slightly above or less than one square mile in size and contain approximately 7.68 miles of open roads which are the sole access into the area and would therefore not be considered for closure. Because these portions of these subwatersheds result in a very small number of acres being analyzed within each management area which results in skewed road densities due to the inappropriate scale of the analysis area for an evaluation of this type resulting in figures which do not provide useful information (FLRMP, page 4-35) they were not carried forward in this analysis.

Effects

The following describes the direct, indirect, and cumulative effects of the East Face project alternatives on access and the transportation system. The analysis area boundary is the project area boundary.

No Direct, Indirect, or Cumulative Effects on Access and Transportation

The following activities associated with the East Face project have been analyzed and are of such limited context and constrained nature that they would have little to no measurable effect on transportation resources.

- Precommercial thinning without harvest removal
- Snag Retention
- Non-commercial fuel reduction work by hand
- Hand treatments within RHCAs
- Connective corridors
- Mitigation Measures
- Whitebark Pine treatments

These activities and their effects will not be discussed further in the transportation resources section.

Direct/Indirect Effects for Access and Log Transportation

A sustainable roads analysis for the forest was in the process of being developed in accordance with the 2005 Travel Management Rule, Subpart A. Because of its unavailability for use, resource specialists have been consulted during on-the-ground field reconnaissance to assist in providing recommendations for management of the road system based on resource impacts, effectiveness, and sustainability. A summary of findings and specialist recommendations is included as an appendix to this document. The effects (direct, indirect and cumulative) of Alternatives 2, 3 and 4 would be similar for the road system, while the effects of Alternative 5 would be slightly different, because in addition to the post-sale road system identified in Alternatives 2-4, it also proposes extending the promulgated seasonal closure for the Clear Creek and Indian-Gorham closure areas to include all elk hunting seasons. The effects of Alternative 1 are described below.

ALTERNATIVE 1

Alternative 1 would not use or change the existing transportation system, and access to the area would remain the same. Road maintenance on the majority of the road system would be deferred until future entries into the area or procurement of additional funding could provide this work. Maintenance on the main system roads in the area (Roads 73and 7312) would continue to be provided on a 1-3 year cycle, while other collector routes would be maintained at a longer interval (5-8 years),or as funds become available. Road densities and number of miles of road open to the public for access would remain the same as described in the existing condition. Roads that are closed and still being used would continue being used. No roads would be improved with reconstruction or timber sale maintenance, and no change in the management of the road system would occur. Resource problems tied to the road system in its current condition would continue to occur. There would be no change to the deferred maintenance backlog of over $1 million, and in fact, it would continue to rise, as periodic road maintenance would be performed only on a few higher level roads on a cyclic basis due to the level of appropriated funding received by the Forest.

ALTERNATIVES 2, 3, 4, and 5

Temporary Roads

Temporary roads would need to be used for vegetation management activities for the project under Alternatives 2, 4, and 5 (Table 5). Of these, some would lie on existing templates of non-system road prisms that currently exist on the landscape. These road templates exist in a variety of states, and may have grown over, been partially decommissioned, or are otherwise in a state that only a minimal amount of work would be needed to open them for use. Where there are units with no road access, temporary roads would need to be constructed to facilitate vegetation management activities. No new, permanent road construction is proposed for this project, and temporary roads would be closed and rehabilitated after activities have completed. Rehabilitation would be done in such a manner as to discourage use, reduce or eliminate erosion and sedimentation, and promote the natural regeneration of vegetation. Therefore, the temporary roads proposed in Alternatives 2, 4, and 5 would have no effect on the current road system.

Road Maintenance

Under all the action alternatives, several miles of road would be used and maintained (Table 5). Road maintenance would be required to be performed by the purchaser or contractor in accordance with Region 6 contract provisions and supplemental T-Specifications. These maintenance activities involve such things as brushing, logging out, road blading, pothole patching, ditch cleaning, and cleaning of culverts and other drainage devices. Danger tree removal would be required under specification T-854, and would require the treatment and/or disposal of live or dead trees that pose a hazard to contractors operations. These trees would be felled, and most will be left on the ground. Additionally, placement of aggregate surfacing on limited portions of road and application of dust abatement may be required. Dust abatement usually consists of placement of water on the travelled way, but on roads with a heavy volume of timber haul, magnesium chloride or lignin sulfonate may be utilized for cost-efficiency and effectiveness. In accordance with 16 USC 537, deposits for surface rock replacement would be collected from the purchaser or contractor for commercial haul over roads with aggregate or paved surfacing. In lieu of deposits, commercial users may perform maintenance or provide materials proportionate to their share of collections (36 CFR 212.5 (d) (3)). Bridge maintenance would also be performed on the 3 bridges located in the project area.

In these alternatives, there would be closed (ML 1) roads which would need to be re-opened for use. Upon completion of haul over these roads, most will be waterbarred and reclosed. The number of miles of closed roads that would be used for vegetation management varies between alternatives and are shown in the Table 7.

Open (ML 2-5) roads would be used for vegetation management activities for Alternatives 2, 3, 4, and 5. The commercial operation would use and maintain these roads, and upon completion of contract activities, most of these roads would remain open. A very small amount of the open roads would be proposed for closure as reflected in the recommended objective maintenance level in Table 7.

It is estimated that the road maintenance costs would range between $1,000-$1,500 per mile. If spot rocking is required, these costs would increase. Haul and placement costs for spot rocking are estimated to be approximately $20/cubic yard (or approximately $30,000/mile). These costs would vary depending on haul distances, location of the source, and the type of material being used. If pothole patching is required on NFSR 73, the cost for this type of maintenance would be approximately $700/ton of asphalt placed. The action alternatives would be estimated to perform approximately $300,000-$700,000 of road maintenance, thus providing a significant impact (reduction) to the deferred maintenance backlog of over $1 million.

Road Reconstruction

Due to limited harvest operations in the area over the past 15-20 years, many roads have become difficult to navigate, have grown in with small trees, or have otherwise become unusable. These roads will require reconstruction to accommodate vegetation management operations. Some roads have sloughed in, eroded, developed springs in the travelled way, have had culverts removed, or were built and remain in such a primitive state (narrow widths, tight corners) as to render them unsuitable for haul with today's log trucks, mule-trains, and chip vans. In all alternatives, there are roads identified for reconstruction activities (Table 7). Some of this work could be considered as incidental reconstruction or reconstruction-like maintenance of the travelled way. In other words, they need trees fell and stumps grubbed for the road to become passable, but all work would be confined to the existing road template, and no new ground would be disturbed.

The remainder of the road reconstruction would involve improvement of the travelled way to obtain road widths and support heavy haul, as well as addressing drainage problems, safety issues, and resource concerns. The number of miles of operational (OP) ML 2-3 roads and OP ML 1 reconstructed are shown, by alternative, in the table, below. Roads 43, 4330, 4350, and 4380 are all roads used in all action alternatives and are proposed to remain open to vehicular traffic. All have some serious drainage and erosion concerns. Road 7312 is also an integral route for any type of operation (commercial and non-commercial). This road hosts a load-rated bridge across the North Fork Anthony Creek which would need to be replaced for any truck or heavy equipment traffic to use. In all alternatives, roadbed stabilization, excavation, addition of drainage structures, and placement of pit-run or crushed aggregate surfacing would be accomplished to accommodate vehicular use or to achieve an extended season of haul over routes that are fundamental to the harvest and post- sale operations. Reconstruction costs for this project area are estimated to be $10,000-$75,000 per mile, depending upon the level of intensity of the proposed reconstruction. Reconstruction activities would utilize material sources within the project area. All of these sources have been developed, and use of these sources would not expand any source greater than 5 acres.

A summary of the actions of each alternative on the transportation system is shown in Table 104, below:

Table 104 - Road Use Comparisons by Alternative

	Description	Alternatives				
		1 (Miles)	2 (Miles)	3 (Miles)	4 (Miles)	5 (Miles)
Total miles of road used for harvest activities		**0.0**	**224.5**	**174.4**	**115.8**	**244.5**
Maintenance	Closed roads (open, use and maintain)	**0.0**	**107.0**	**66.9**	**38.6**	**122.7**
	Closed roads used, then reclosed		100.5	60.4	32.1	116.2
	Closed roads used, then left as open roads		6.5	6.5	6.5	6.5
	Open roads (use and maintain)	**0.0**	**117.5**	**107.5**	**77.2**	**121.8**
	Open roads to remain open		116.9	107.5	76.6	121.8
	Open roads to close after harvest		0.6	0.0	0.6	1.1
Reconstruction	Roads with full reconstruction	**0.0**	**53.0**	**39.3**	**27.8**	**61.6**
	Open roads		20.4	20.9	16.5	23.6
	Closed roads		32.5	18.4	11.3	38
	Roads with heavy maintenance	**0.0**	**35.5**	**18.2**	**16.5**	**42.2**
	Open roads		0.1	0.1	0.1	0.1
	Closed roads		35.4	18.1	16.4	42.1
Temporary Roads	Temporary roads needed for harvest (total)	**0.0**	**12.62**	**0**	**2.62**	**14.71**
	Temp roads on existing templates		6.01	0	0.67	6.57
	Temp. roads needing construction		6.61	0	1.95	8.14

Road Management

Generally, the transportation system in the East Face analysis area would be managed in the same manner it has been managed over the past 20 years; however, a few changes would be proposed. Road 7312100, also known as the High Mountain road, is currently ineffectively closed in the interior section, and would be recommended to remain an open, through route connecting Roads 7312 and 4380. A short spur (7312140) off this road, and the road into the Dutch Creek material source (7312400) would also be proposed to remain open. Associated with these proposed changes, it would be proposed to close Road 7312150, a road paralleling in very close proximity to the North Fork Anthony Creek. This road would be rehabilitated to reduce erosion and protect water quality in this drainage.

Additionally, in Alternative 5 only, the closure periods for the Indian-Gorham and Clear Creek Cooperative Closure areas would be extended to 3 days prior to archery season and through the end of second rifle bull season. Closed, overgrown roads that would be opened for project use would have a promulgation that would restrict vehicular use for 5 years.

The proposed changes in road management described above make only minor changes to the already low open road densities in the project area. The following table exhibits this information.

Table 105 - Post-Sale Open Road Densities

SUBWATERSHED NAME	MA	GIS Acres	Area in Sq Miles	Open Rd Miles	Open Rd Density (mi/mi^2)
Lower Anthony Creek	1	7,820	12.22	13.43	1.1
Middle North Powder River	1	3,656	5.71	15.02	2.6
Upper Anthony Creek	1	11,193	17.49	17.44	1.0
Upper Beaver Creek	3A	3,389	5.30	9.82	1.9
Upper Ladd Creek	1	1,438	2.25	10.13	4.5
Upper Wolf Creek	1	13,725	21.45	41.84	2.0

Miles shown are calculated from GIS. In areas where the square miles are less than 0.1 mi/mi^2, the road density has been rounded to zero, and is not being shown, for clarity.

The MA1 portion of Upper Ladd Creek is approximately 2 ¼ square miles of the nearly 70 square mile project area. This small sliver of subwatershed contains five open roads, of which two are the major access through this portion of land: 4.3 miles of Road 43 and 2.3 miles of Road 4300160. The other 3 roads generally provide access to private and BLM land adjacent to the area. Because this sliver of subwatershed is so small in scale, the calculated open road densities are skewed and not representative of what these densities would be if calculated at scale of an entire subwatershed of 12,000-26,000 acres. Upper Beaver Creek is slightly above forest plan density standards for MA3A (1.5 miles/square mile) because of the presence of Road 43 in this subwatershed. Similar to Upper Ladd Creek, only a sliver of the subwatershed was included in the East Face project area, thus skewing the road densities. Because the calculation was restricted to the East Face project area, it did not take into consideration the Beaver Creek Roadless Area immediately adjacent to the project area and within the same subwatershed. Incorporating the roadless area portion of this subwatershed lowers the open road density to well below the summer range standards.

There several road segments in the East Face project area that the interdisciplinary team identified as not needed for future resource management or recreation access, or they provide redundant access, and this analysis has recommended them for decommissioning. These roads generally have grown in or devolved to such as state as to be impassable, and often have invisible templates. Treatment of these roads would address hydrologic concerns such as reducing sedimentation by providing additional drainage structures in the form of surface cross drains. This action would occur separate from any commercial operation as funds become available. Additionally, there are roads in the area which are not scheduled for commercial use, but operate at a maintenance level that is different from the objective maintenance level of the road. These objective levels are listed in the INFRA database and reflect past NEPA decisions on road management in the area, or are recommended for future change in the objective maintenance level. The operational ML of these roads would be changed once on-the-ground work has been implemented, either by the commercial activity, post-sale improvements, or as supplemental funds become available. A summary of the existing and recommended changes in road management are shown in Table 106, below. This summary is inclusive of all roads in the analysis area.

Table 106 - Summary of Recommended Changes in Management of Roads *

Existing Operational Maintenance Level	Existing Objective Maintenance Level	Recommended Objective Management	No. of Miles of Road Affected
Closed Road (OPML 1)	Closed Road (OBML 1)	Decommission	26.8
		Close/Store (OBML 1)	201.4
		Open (OBML 2)	6.5

Existing Operational Maintenance Level	Existing Objective Maintenance Level	Recommended Objective Management	No. of Miles of Road Affected
	Open Road (OBML 2)	Close/Store (OBML 1)	0.06
	Decommission	Decommission	2.01
		Close/Store (OBML 1)	0.01
		Open (OBML 2)	0.09
Open Road (OPML 2-5)	Closed Road (OBML 1)	Close/Store (OBML 1)	1.52
		Open (OBML 2)	0.07
	Open Road (OBML 2-5)	Close/Store (OBML 1)	0.23
		Open (OBML 2-5)	109.22
		Decommission	2.12
	Decommission	Decommission	0.36
		Total	363.94

*Numbers include past road management decisions and new road management opportunities.

Right of Way

For Alternatives 2, 3, 4, and 5, the right-of way issues associated with one of the main collector routes would be resolved. Right-of-way would be acquired in the form of an easement across approximately 0.5 miles of NFSR 7302 located in T7S, R 38 E, Section 6. This would assure legal access for all types of vehicular and non-vehicular traffic on this long-term open road.

Over-Snow Routes

Roads 43, 4300020, 4300095/4300100, 4315, 4316, 4330, 4350 and 7312 will remain designated as winter snowmobile routes. If winter haul was proposed, use of these routes would be coordinated with the local snowmobile clubs. No changes would be proposed for this system. No change is proposed in the management of the Nordic or Alpine ski routes. Refer to the recreation analysis for further details.

Cumulative Effects on Access and Log Transportation

ALTERNATIVE 1

As described under the direct and indirect effects of the no action alternative, maintenance and improvements would not occur and the road system within this area would continue to degrade. Under the 2005 Travel Management Rule, the forest is required to designate a road system for vehicular use. Since the forest is currently an open forest for vehicular use, these designations may be more restrictive than what is currently allowed. This may result in concentrating the recreational, commercial, and administrative users on a smaller number of roads. This concentration of use may generate conflicts between users, especially with OHVs and full-size traffic. Increasing the number of users on a smaller road system would increase the amount of wear on the roads. More frequent blading of roads may mitigate these negative impacts on the road surface and surfacing. This increase in maintenance would require additional funding which is not predicted to occur based on current declining budget trends. Therefore, road maintenance would be deferred until funding becomes available. Designation of roads, trails, and areas by publishing of the MVUM would have a minimal short-term effect on the transportation system as it currently exists on the ground. Long-term, as use and maintenance is eliminated on undesignated roads, these roads are likely to grow over with trees and vegetation and become unusable.

Implementation of activities such as noxious weed management would continue to occur within the areas accessible for treatment; however, this may be impacted as access is reduced.

ALTERNATIVES 2, 3, 4, and 5

Commercial Harvest and Post-Harvest Activities

The effects of most projects proposed in the foreseeable future are negligible on the transportation system; however, the effects of possible timber haul from the Elkhorn Wildlife Area or private land operations on the roads may have an initial negative effect due to wear on the road surface. It is anticipated that this would be mitigated by the road maintenance and reconstruction requirements of pre-haul, during-haul, and post-haul operations. In addition, the surface rock replacement deposits by the timber purchaser would provide a means to maintain/repair/replace the crushed aggregate, should it wear out due to the timber haul. Timber sale road maintenance should provide a beneficial effect to the road system beyond the close of the project.

Noxious weed management of the existing invasive populations within the project area in combination with the prevention measures for the East Face project has the potential to improve the ability to control roadside noxious weed populations. Known populations will also be treated before roads are either reclosed or decommissioned which will minimize the potential for spread by continued motor vehicle use.

Travel Management

The 2005 Travel Rule established regulations for Travel Management under 36 CFR 212, Subparts A, B, and C. To comply with the 2005 Travel Management Rule (TMR) the WWNF began a planning effort to designate roads, trails, and areas for public motor vehicle use in 2007. The 2012 WWNF TMP FEIS displays a range of alternatives meeting the intent of the TMR and the effects of implementing them. The range of alternatives from the TMP FEIS was considered the best representation of a reasonable range of potential effects that could occur upon implementation for use in this analysis. While a specific number of miles of designated routes (roads and trails) will not be known until a decision is made, the analysis from the WWNF TMP FEIS indicates that designated routes could range from a potential high of approximately 6,700 miles to a potential low of approximately 2,600 miles and x-country motor vehicle use would be managed. Once a final decision is made, the roads, trails, and areas designated for motor vehicle use by the public will be displayed on a Motor Vehicle Use Map (MVUM) and x-country motor vehicle travel will be regulated.

As described under Alternative 1 above, designation of routes for motor vehicle use may result in concentrating the recreational and commercial users on a smaller number of roads. This concentration of use may generate conflicts between users, especially with OHVs and full-size traffic increasing the amount of wear on the roads. Road maintenance completed under the East Face project may mitigate some of these negative impacts on the road surface and surfacing possible decreasing the funding needed for maintenance while sale and project activities are going on. Long-term, as use and maintenance is eliminated on undesignated roads, roads not designated for motor vehicle use are likely to grow over with trees and vegetation and become unusable.

Table 107 - Total Transportation System Maintenance Levels (Pre- and Post-Project)

Maintenance Level	**Operational** (# Miles Pre Project)	**Objective** (# Miles Post Project
Maintenance Level 5	10.5	10.5
Maintenance Level 3	3	3
Maintenance Level 2	113.5	116
Maintenance Level 1	237	196

Maintenance Level	Operational (# Miles Pre Project)	Objective (# Miles Post Project
Decommission	N/A	31.3
Total	364	364

Heritage Resources

Introduction

This section covers the existing conditions and effects of implementation for heritage resources. Reports and analyses can be found in the East Face analysis file.

Prehistory

The East Face project area elevation ranges from 3,780 feet to 7,550 feet. Due to the elevation gradient of the project area Native American use is assumed to have been occasional to seasonal. Temporary camps were limited to spring, summer, and early fall use. Deer, elk and other big game continue to be a significant source of meat for Tribal members today. Plants are also gathered within the region by Tribal members. Important vegetation of the Blue Mountain Province of the Columbian Basin physiographic area includes trees (ponderosa pine, grand fir, Douglas fir, and western larch), grasses and shrubs (bluebunch wheatgrass, Idaho fescue, and bitterbrush), berries (strawberry, serviceberry, gooseberry, huckleberry, current, and chokecherry), and roots (camas, cous biscuitroot, bitterroot, wild carrot, and wild onion).

Prehistoric and historic American Indian cultural resource site types may include lithic scatters (chipped stone artifacts), resource utilization areas such as tool stone quarries and plant processing sites, seasonal camps such as small habitation areas or large villages, and special places. Special places may consist of sites and places that are valued for cultural, religious, or traditional importance (for example, traditional food locations such as berry areas, root gathering areas, medicinal plant grounds, and collection areas for materials for utilitarian and ceremonial craft production, as well as usual and customary hunting and fishing locations.). Artifacts may include obsidian, chert, or basalt projectile points, knives, scrapers, burins, bi-faces, utilized flakes, and debitage. Bone tools, stone cobble tools, mortars and pestles, net sinkers, beads, and metal objects such as those relating to firearms may also be included in artifact assemblages.

History

Trappers and Protestant and Catholic missionaries began to arrive in the area around 1807. In 1855, treaties were formed with the Cayuse, Umatilla, Walla Walla, and Nez Perce tribes. Persons who traveled to the Willamette Valley often passed through northeastern Oregon on the Oregon Trail. Settlements were not established in the area until the 1860s at the same time gold began to be discovered. Gold mining created the need for new and larger settlements. Gold camps stimulated the economy through their demand for food, living supplies, and mining equipment. The need for food brought ranchers to the area. Once the railroad reached the region, the lumber market grew. By the 1880s, lumber began to be shipped to distant markets.

Effects Analysis

The East Face Fuels Reduction Project heritage resources analysis area encompasses all of the 47,636 acre project area. The area of potential effect, following Region 6 guidance and 36 CFR 800.16(d), for the East Face project area consists of slopes less than 15 percent within the analysis area. Site records and existing maps were reviewed; all known sites were surveyed again for this project. Transects that follow

Oregon State Historic Preservation Office guidelines at 20 meter intervals were used. Springs are considered a high potential area and were surveyed.

Cultural resource identification in the project area focused on three primary types of resources: prehistoric archaeological sites, historic archaeological sites, and places that support resources of contemporary tribal interest. No new or isolated sites were discovered within the project area.

Direct, Indirect and Cumulative Effects on Heritage Resources

ALTERNATIVE 1 – No Action

Past vegetation management and aggressive wildfire suppression combined with insects and disease within the project area have influenced existing conditions. Many of the stands have become overstocked with small diameter shade tolerant trees with a heavy loading of surface fuels. These conditions would continue and the potential for a high intensity wildfire would increase.

Under this alternative, no treatment activities would be undertaken. Heavy accumulations of surface fuels and small diameter trees would continue to degrade many of the heritage sites within the project area.

ALTERNATIVES 2 - 5

Avoidance criteria built into the design of the action alternatives provides protection of all known heritage resources within the project area. Mitigation measures are in place and will be part of contract specifications should any new cultural sites be discovered during project activities. Because these measures are adequate to protect heritage resources within the project area there are no direct, indirect or cumulative effects on heritage resources from any of the alternatives within this project. Alternatives 2 and 2A would be consistent with the Wallowa-Whitman Land and Resource Management Plan as all cultural resource standards and guidelines would be met (USDA Forest Plan 1990).

BLM Lands

The Class II cultural resources inventory of the East Face project resulted in one newly recorded site and one Isolated Finds (Ifs). Two previously documented sites could not be relocated. All of the newly recorded and updated sites were not evaluated for the National Register of Historic Properties (NRHP) per BLM guidance. All site boundaries were flagged for avoidance and will not be impacted by project activities. The IFs are not eligible for the NRHP and no additional research or preservation is required. Currently the status of the newly recorded site will remain unevaluated for the NRHP. The site would be treated as eligible and be avoided until NRHP eligibility can be determined through consultation and/or testing. The site would be protected from project activities by flagging (completed during site recording), fencing, and/or other protection measures. Other protection measures may also be implemented by BLM.

Climate Change

The East Face Fuels Reduction project would affect 2,844 to 10,221acres of forest by commercially removing trees from treated stands, retaining a residual stand of about 50-70 percent of the original stand by basal area. This scope and degree of change would be minor relative to the amount of forested land (184,800 acre watersheds) which encompasses this project area. A project of this magnitude would have such minimal contributions of greenhouse gasses that its impact on global climate change would be infinitesimal. Therefore, at the global scale, this projects' direct and indirect contribution to greenhouse gasses and climate change would be negligible.

In addition, because the direct and indirect effects would be negligible, the projects' contribution to cumulative effects on greenhouse gasses and climate change would also be negligible.

The Intergovernmental Panel on Climate Change has summarized the contributions to climate change of global human activity sectors in its Fourth Assessment Report (IPCC 2007). The top three anthropogenic (human-caused) contributors to greenhouse gas emissions (from 1970-2004) are: fossil fuel combustion (56.6% of global total), deforestation (17.3%), and agriculture/waste/energy (14.3%). IPCC subdivides the deforestation category into land use conversions, and large scale deforestation. Deforestation is defined as removal of all trees, most notably the conversion of forest and grassland into agricultural land or developed landscapes (IPCC 2000).

This vegetation management project does not fall within any of these main contributors of greenhouse gas emissions. Forested land will not be converted into a developed or agricultural condition. In fact, forest stands are being retained and thinned to maintain a vigorous forested condition that can continue to support trees and sequester carbon long-term.

This project is also consistent with IPCC recommendations for land use to help mitigate climate change. The 2007 IPCC report summarizes sector-specific key mitigation "technologies". For the forestry sector, the report recommends forest management including management to "improve tree species" and increase biomass. The actions proposed in this project are consistent with these recommendations because it focuses on silvicultural prescriptions which will improve stand health and vigor contributing to tree growth and increased biomass production.

Timber management projects can influence carbon dioxide sequestration in three main ways: (1) by increasing new forests (afforestation), (2) by avoiding their damage or destruction (avoided deforestation), and (3) by manipulating existing forest cover (managed forests). Land-use changes, specifically deforestation and regrowth, are by far the biggest factors on a global scale in forests' role as sources or sinks of carbon dioxide, respectively (IPCC, Intergovernmental Panel on Climate Change, 2000). Projects that create forests or improve forest conditions and capacity to grow trees are positive factors in carbon sequestration. The project falls into this category.

Recreation

Introduction

The East Face project area is 47,636 acres of mixed federal, state, and private land on the east slope of the Elkhorn Mountains, west of the community of North Powder. The project area sustains a diverse mix of recreational opportunities and needs. Much of the highest-intensity recreational use occurs along the 73 road, which is a state-designated scenic byway. Multiple trailheads and campgrounds are found along this road, as is the Anthony Lakes ski area, which attracts skiers from the tristate area on winter weekends. The Floodwater Flats recreation residence tract is adjacent to the ski area. In addition to the developed recreation opportunities at and around Anthony Lakes, East Face encompasses many other routes that lead into less-developed parts of the forest. The most popular of these routes are the 7312 road, the 43 road, and the 4315 road. While developed recreational opportunities are not found along these roads, they are frequently utilized by those individuals who wish to camp and recreate in a dispersed and primitive setting. The highest use period for these roads is during the big game hunting season in late summer and fall. Each of these areas will be analyzed in greater detail below.

Existing Condition

73 Road/Elkhorn Scenic Byway

The densest concentration of developed recreation in the East Face Project Area is on the 73 road, specifically in the vicinity of Anthony Lakes Recreation Area. This section of the 73 road represents a portion of the state-designated Elkhorn Scenic Byway. Several campgrounds and trailheads are located around Anthony Lakes, including the northern terminus of the Elkhorn Crest National Recreation Trail. Anthony Lakes Campground and Mud Lake Campground are both situated within a dense forest dominated by subalpine fir and lodgepole pine. They are at risk from the stand-replacing wildfires characteristic of those forest types. Selective thinning to reduce fire risk while still maintaining desirable aesthetic qualities of privacy and screening within the campgrounds will benefit the recreational resource.

Anthony Lakes Recreation Area is a year-round hub for recreation at the Wallowa-Whitman National Forest. In winter, the ski resort is popular with skiers and snowboarders from around the region. In addition to the lift-serviced terrain at the resort, skiers can explore several miles of established Nordic trails as well as remote backcountry areas. The whitebark pines near the summit of Anthony Lakes Mountain Resort provide a uniquely accessible opportunity for casual recreationists to learn about this rare tree species.

During the summer months, trailheads and campgrounds along the 73 road are used by dayhikers, campers, and backpackers. Several trailheads along 73 and at Anthony Lakes lead to popular high-elevation lakes and ridgetops. The 23-mile Elkhorn Crest Trail was designated at a National Recreational Trail in 1979. A short portion of the trail is within the North Fork John Day Wilderness. Anthony Lakes is an emerging destination for mountain biking, and the Nordic trail system is frequently used by bikers in the summer and fall. There are currently plans in place to expand the mountain bike trail system to include portions of the ski area as well.

7312 Road

The 7312 road is near the eastern boundary of the East Face Project Area. Like other areas within East Face, this road is heavily used by hunters and dispersed campers in the late summer and fall.

Mountain bikers ride on a closed road system off the 7312 near Gorham Butte. Although not formally designated or managed by the forest, this network of trails (7315, 7315030, 7315035, 7315040, 7315045, 7315047, 7315048, 7315090, 7312, 7312031, 7312032, 7312033, 7312034, 7312035) has been gaining popularity in recent years and have the potential to become an important component of the burgeoning Anthony Lakes mountain bike circuit.

43 Road/4315 Road

The 43 road forms the western and northern boundaries of the East Face Project Area. This road connects the Grande Ronde Valley and Ladd Canyon with the high-elevation terrain near Anthony Lakes.

Grande Ronde Lake Campground is near the junction of the 43 and 73 roads. This is a moderately busy campground and day-use area, which also features a boat dock. The campground is situated within a dense forest dominated by subalpine fir and lodgepole pine. It is at risk from the stand-replacing wildfires characteristic of those forest types. Selective thinning to reduce fire risk while still maintaining desirable aesthetic qualities of privacy and screening within the campground will benefit the recreational resource.

The quality of the 43 road diminishes north of Grande Ronde Lake. Near the eastern boundary of the Beaver Creek Roadless Area, the road quality improves again, and this section of the Project Area sees the greatest amount of traffic during the hunting season. Numerous popular dispersed camp sites are located along the 43 road and associated smaller roads.

Special Uses within East Face

A variety of recreation and non-recreation special uses occur under permit within the East Face project area. These uses include:

- The Floodwater Flats recreation residence tract is near Anthony Lakes and is approximately 35 acres in size. The tract consists of 24 cabins and associated facilities such as storage sheds, outhouses, and propane tanks. The cabins are administered by the Whitman Ranger District under 20-year special use permits and are an important component of the Anthony Lakes WUI. Fuel reduction activities conducted within the last 10 years by the Forest Service have reduced the overall risk of catastrophic loss due to wildfire in within the tract. The actions were generally limited to within 200' of the tract. For reasons of aesthetics or desire for privacy and screening, not all residents wished to have fuel reduction activities take place adjacent to their cabins.

- The Aud & Di concessionaire operates three campgrounds (Anthony Lakes, Mud Lake, and Grande Ronde Lake) and a day-use area under a special use permit. All three of these campgrounds are in high-elevation subalpine fir and lodgepole pine stands that are at significant risk from stand-replacing wildfires.

- USDA – NRCS has multiple meteorological and snow survey sites within East Face. A SNOTEL site is on a ridgetop above Wolf Creek in T. 6 S., R. 37 E., S. 2. Additionally, NRCS has three snow survey courses along the 73 road at T. 7 S., R. 37 E., S. 12; T. 7 S, R. 37 E., S. 9; and T. 7 S., and T. 7 S., R. 37 E., S. 18. NRCS performs annual maintenance on all facilities in the summer and fall. Since the snow courses and the SNOTEL site are used for long term climate monitoring, it is critical that no significant vegetation disturbance occur within 200' of the sites.

- Adventures Across Oregon (AAO) operates fly fishing services under a temporary Outfitter & Guide permit within the East Face project area. Depending on the body of water they are attempting to fish, access may be limited due to management activities.

- Anthony Lakes Mountain Resort (ALMR) operates the ski area, lodge, rental shop, and associated facilities under a special use permit.

- Oregon Trail Electric Co-Op (OTEC) maintains a power transmission line in a Right-of-Way through the East Face area, roughly adjacent to the 73 road. OTEC is permitted to manage vegetation within their ROW to prevent interference with their transmission lines. This management will include cutting trees within the ROW and, if future requests are granted, may also include cutting trees outside the ROW that are tall enough to pose a hazard to OTEC infrastructure.

- Cascade Utilities/Reliance maintains a buried line through the East Face area which provides phone and internet service to residents along the 73 road.

- Several local snowmobile clubs in conjunction with Oregon State Snowmobile Association (OSSA) maintain groomed snowmobile routes through a special use permit. All groomed routes are on roads that are open to vehicular traffic during the summer. Designated routes include all or part of the following roads within East Face: 43, 43020, 4315, 4316, 4330, 7312.

- Some recreation activities are managed under permits which allow recreationists or operators to do certain activities under the terms of the permits. These permits include: gathering firewood, gathering forest products like mushrooms and berries, and hunting. Although no data is available for how many permits are used in the East Face area, these activities can generally occur in most areas outside of riparian areas, old growth areas, tree plantations, or other specially designated locations described on the permits.

Effects

Introduction

The following analysis describes the effects of implementing the actions in the East Face project on recreation resources and permitted special uses. The analysis area for determining direct, indirect, and cumulative effects on these resources is the project area boundary.

Table 108 – Overview of East Face Alternative Treatment Acres

Alternative Elements	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Harvest/Noncommercial Treatment Acres	0	17,098	13,654	16,500	18,036
Harvest Treatment Acres (total)	0	6,722	3,879	2,844	10,221
Noncommercial Treatment Acres (total)	0	10,376	9,775	13,656	7,815
Prescribed Fire (Acres)	0	6,685	6,043	6,643	6,685

No Direct or Indirect Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would not be easily seen upon implementation and therefore have no effect on Recreation resources or activities.

- Planting
- Whipfelling
- Hand treatments within RHCAs
- Mechanical control lines for burning
- Invasive species treatments
- Connective corridors
- Snag retention
- Roadside hazard tree removal
- Whitebark Pine treatments
- Prescribed burning

These activities and their effects will not be discussed further in this report.

Direct and Indirect Effects to Recreation

ALTERNATIVE 1 – No Action

There would be no direct or indirect effects under Alternative 1 to recreation resources. Vegetation densities or characteristics would not be modified and the forest would continue to be influenced by natural processes and limited management actions, such as fire suppression. Because no management activities would result under this alternative, no change is anticipated in the number of visitors, frequency or season use in dispersed recreation activities, developed recreation sites, trails, or permitted uses. Recreational visits within the project area would remain near the same levels as previous years and under this alternative traditional use patterns and recreational opportunities would not be affected. Hunting, hiking and other dispersed recreation and permitted uses access and opportunities are expected to remain unchanged.

In the long term, there is an increasing risk to forested areas by insect and disease epidemics and greater fuel loads increasing the risk of large stand replacement fires. Depending on where they may occur, these types of events have to large potential to negatively impact recreation resources and permitted uses within the project area for many years following the event. The effects of the 1960 Anthony Burn are still being realized within the project area in terms of acres of thickets of lodgepole pine which severely restrict access on foot or with a vehicle.

ACTION ALTERNATIVES (Alternatives 2-5)

The following describes the direct and indirect effects of implementing Alternatives 2-5 on dispersed recreation, developed recreation, developed trails, and permitted use resources.

<u>Dispersed Recreation</u> - Timber harvest, post-harvest, and prescribed fire activities may restrict user access into a treatment unit due to safety purposes, or users may be discouraged from entering a unit due to the presence of equipment and workers. This may occur in peak summer visitations or during the fall hunting seasons. Downed trees, slash piles, loss of forest-products (i.e. mushrooms, berries), active fire and residual smoke would also discourage visitor use in an area. Noise and other disturbances may affect the quality of the recreation experience for an individual regardless of the proximity to the activity.

A change in natural features or landscape characteristics may elicit different responses in visitors. A visitor's sense of place includes attachments to external factors like natural features or landscape characteristics. Important landscape features may consist of large old growth trees and groves, variety of trees species, an open or closed tree canopy, rock formations, water bodies, and natural appearing openings. The proposed treatments such as harvesting trees, reducing slash or altering canopy cover would change or remove some of these natural features. In some cases the changing landscape would displace or discourage certain types of dispersed recreational activities (i.e. studying nature, viewing wildlife). In other areas it may encourage new dispersed recreational activities (i.e. big game hunting, photography) not available under the previous landscape.

Alternatives 5, 2, and 4 have the most acres of commercial, non-commercial, and prescribed burning (Table 108); therefore these alternatives have the highest potential to impact dispersed recreation as described above. Alternative 3 treats the least number of acres and has a lower potential to impact dispersed recreation.

Direct effects to recreationists accessing dispersed camps in the project area or other areas would occur on roads during haul periods. The presence of large trucks or an increased frequency of traffic may discourage road use to these sites until the road work subsides. When roads are being constructed/reconstructed visitors may expect delays or closures during work periods. Road 7312150 will be closed at the conclusion of the project, which would have a direct effect on dispersed car camping along North Fork Anthony Creek.

The system of closed roads frequently ridden by mountain bikers near Gorham Butte would be affected by management activities. Effects to the system might range from widening of grown-in roads to complete obliteration of trails. Effects could last from a few months to several years depending on their severity. Portions of the following roads are currently used as a mountain bike trail system and could be affected by project activities: 7315, 7315030, 7315035, 7315040, 7315045, 7315047, 7315048, 7315090, 7312, 7312031, 7312032, 7312033, 7312034, and 7312035.

Due to the quantity of roads either built or re-opened under Alternative 5 (137 miles), Alternative 2 (113 miles), Alternative 3 (67 miles), and Alternative 4 (41 miles), OHV use could increase throughout the project area. Although the roads would technically be closed at the conclusion of the project, it is unlikely that OHV use on the roadbeds would cease at that time unless significant obliteration was undertaken. Additionally, a more open forest type adjacent to these roads would increase the frequency and ease of cross-country OHV travel after the completion of the East Face project completion where more of this would happen in those alternatives which treat more acres.

Developed Recreation - Although similar to the effects of dispersed recreation, developed recreation is more extensive due to the number of sites in East Face. Access to developed sites may be delayed or restricted during haul periods, or road construction. The presence of large log trucks and other equipment on haul routes may discourage users from driving the main access route to developed sites or other associated activities outside of the developed recreation area. The noise, dust, smoke and equipment activity during harvest, post-harvest and prescribed fires may affect the quality of the recreation experience for a visitor regardless of the proximity to the activity. The frequency and intensity of these activities may vary from a few hours to several weeks. Some loss or change of vistas, scenery, natural features or wildlife viewing opportunities may result with the vegetation treatments and prescribed fire activities visible from the developed sites.

Alternatives 2, 4, and 5 have the most potential to impact the public accessing developed recreation sites because they commercially treat the most acres along the Anthony Lakes Highway while Alternative 3 commercially treats fewer acres within this corridor.

Developed Trails – Access to popular trailheads along the Anthony Lakes Highway might be delayed or restricted during haul periods or road construction. In general, the East Face Project Area encompasses very little of the system trails originating near Anthony Lakes, so direct effects to the trails will be extremely limited in scope. As with the developed recreation sites above, Alternatives 2, 4, and 5 have the most potential to impact the public accessing developed trails because they commercially treat the most acres along the Anthony Lakes Highway while Alternative 3 commercially treats fewer acres within this corridor.

Under any of the action alternatives, if winter logging is done using the 4300, 4300020, 4315, 4316, 4330, 7312, 4380 roads, use would be coordinated with the District Recreation Manager to designate an alternative snowmobile route while log haul is occurring.

Permitted Uses - All permitted uses are authorized under the term and conditions of a permit which allow activities not available to a non-permitted user. Most of these uses are tied to road access, and the removal of forest products is dependent on specific areas or vegetation. Permitted uses may be affected by project activities. Similar to dispersed recreation, timber harvest, post-harvest, and prescribed fire activities have short term effects and may restrict or discourage entry into a harvest unit. Depending on the level of treatment activity, permit users may be displaced to other areas inside or outside of the East Face area. Increased obstacles like downed trees and slash piles, or changes in stand conditions (through burning and changing stand densities) could modify opportunities for gathering forest-products (i.e. mushrooms, berries). Residual smoke, dust, fire, noise and equipment activity is not conducive to a quality recreation experience. The same effects for road use described in 'Dispersed Recreation' are also applicable to this recreation use. If roads are used for winter haul, they may be available for access by winter recreationist like Christmas tree cutters who normally do not have access in many roads during the winter due to deep snow packs.

Long term effects of harvest and post-harvest treatments would solicit various responses from permit users. Permit holders like mushroom pickers, would find short term benefits from open, disturbed mixed-conifer forest stands, whereas berry pickers may view the loss of some berry patches as a negative effect.

Alternative 3 proposes the fewest treatments adjacent to the power line ROW corridor near the 73 Road. Although permitted fuel and hazard tree reduction activities would still take place within the corridor, this Alternative 3 provides the least comprehensive protection against wildland fire overtaking the infrastructure within the ROW. Alternatives 2, 4, and 5 provide fairly comprehensive protection to this corridor.

All action alternatives allow for fuel reductions in MA6 increasing the resiliency around the Floodwater Flats Recreation Residence tract and the Anthony Lakes WUI. However, Alternative 3 would not provide as much protection to most of the Anthony Lakes recreation area in the event of a wildfire because it treats fewer acres adjacent to the recreation area than the other action alternatives.

Cumulative Effects on Recreation

Past projects and actions which have affected recreation uses include timber harvest, road construction, and recreation uses and have been incorporated into the existing condition for this project. Refer to Appendix D for a full description of present and reasonably foreseeable future activities.

ALTERNATIVE 1

There are no cumulative effects associated with this alternative on recreation resources or permitted uses.

ALTERNATIVES 2-5

This project in combination with current projects have a slight potential to influence dispersed recreation activities by displacing big game hunters, berry pickers, open areas for viewing scenery, etc. Road decommissioning in this project will have a slight impact on motorized use, including closing access to dispersed camping areas; however, leaving roads 7312100 and 7312400 open after project completion will offset some of these impacts. The Forest Travel Management Plan (TMP) has the most potential to impact motorized and non-motorized users as it will designate roads, trails, and areas where the public may recreate with their motor vehicles. Restrictions on cross-country motor vehicle travel could reduce the effect to non-motorized recreation activities from the sight, sound and emissions of vehicles. It may also impact special uses such as firewood gathering and dispersed camping. Cross-country travel restrictions while possibly impacting firewood gathering, would provide additional protection to snags which may be more available due to the more open nature of the treated stands post-harvest and slash treatments.

Although this project area does not physically overlap in time and space with the Limber Jim/Muir Fuels Reduction project, there is a potential for smoke generated during prescribed burning activities in the Limber Jim project to combine with smoke from East Face burning and impact campers and people using the East Face area.

With the exception of the power line, East Face project activities in combination with the remainder of the special uses within the project area do not create a cumulative impact on recreation or permitted uses.

East Face fuel reduction activities in combination with the power line fuel reduction activities would increase the effectiveness of reducing fire behavior along the power lines. More fuel reduction activities occur in Alternatives 2, 4, and 5 than under Alternative 3.

East Face fuel reduction activities in combination with cabin owner fuel reduction activities will increase the effectiveness of reducing fire behavior adjacent to Floodwater Flats recreation residences.

Once implemented, the travel management plan would manage cross-country motor vehicle use even in areas where the fuel reduction activities have reduced obstacles and motor vehicles could travel. It will also enhance the effectiveness of the regulated cooperative closure areas within the project area and reduce potential user conflicts enhancing non-motorized recreation opportunities.

Log truck traffic and resurfacing activities could create long delays for recreationists coming into the area during the summer months. It could also result in some additional safety hazards along the 73 road for motorists especially during a busy summer season.

Fuel reduction activities and opening closed roads could provide more access for cattle to areas within the East Face area and could end up with cattle within dispersed camp sites or developed areas.

Extension of the closure period in Alternative 5 in the cooperative closure areas would improve non-motorized hunting experiences while reducing some opportunities for motorized hunting during all big game hunting seasons. There would be no change in these areas under Alternatives 2, 3, or 4.

Scenery

Introduction

Local residents, recreation users and tourists all value the scenery within the East Face project area. The landscape character is predominately a naturally appearing to slightly altered forested environment viewed in the foreground, middleground and background of the designated viewsheds of Elkhorn Drive Scenic Byway, Interstate 84, Anthony Lakes Recreation Area and the numerous developed recreation sites located in the planning area In the project area the landscape variety ranges from the common landscape character type typical of the Blue Mountains to unique habitats located throughout the landscape and spectacular scenery associated with Anthony Lakes Recreation Area (USDA 1982).

Existing Condition

Elkhorn Drive Scenic Byway – National Forest Road 73

The Elkhorn Scenic Byway is the main travel route from the communities of North Powder, La Grande and Baker City on the east side of the project area and traverses over to the North Fork John Day River on the west. Destinations along the Elkhorn Drive Scenic Byway in the East Face project area include Baker Valley Scenic Viewpoint, Dutch Flat Trailhead, Van Patten Lake Trailhead, Elkhorn Crest Trailhead and Elkhorn Crest National Recreation Trail and the Anthony Lakes Ski Resort and Recreation Area. East Face provides a backdrop setting viewed from I-84. The scenic byway passes through the project area for approximately 7 miles.

Anthony Lakes Recreation Area

The Anthony Lakes Recreation Area is a popular year round destination area that offers downhill skiing and snowboarding, cross country skiing, snowshoeing, developed camping, fishing, mountain biking, access to special use recreation residences, developed trailheads, Elkhorn Crest National Recreation Trail and many other activities associated with outdoor recreation. Anthony Lake and Mud Lake are special places in the area. Distant views of mountain peaks and large expansive views are seen from the ski area slopes. The spectacular Twin Mountain roadless area is located on the south side of Highway 73, providing a scenic backdrop setting for Anthony Lakes Recreation Area and areas of the Elkhorn Drive Scenic Byway.

Forest Road 43 Ladd Canyon to Anthony Lakes Recreation Area

Ladd Canyon Road begins off Interstate 84 and transitions to the Forest Road 43, it is a primary travel route that follows the project area boundary for approximately 25 miles. The road is the boundary for the East Face project on the west side. The condition of the road is easily accessible by standard vehicles out of La Grande for the first 19 miles where it is graveled until reaching Rainbow Road 5215 then it transitions to a rougher primitive road for the last 6 miles until reaching the Anthony Lakes Recreation Area. There are no developed recreation sites along the travel route but the area is used for dispersed recreation activities of driving for pleasure, sight-seeing, hunting, camping, and accessing other forest road networks in the area.

North Fork Wolf Creek Forest Road 4315

North Fork Wolf Creek Forest Road 4315 is accessed off County Road 104 on the east end of the project area or from Ladd Canyon Forest Road 43. It travels through the project are for approximately 6 1/2 miles. The road is single lane gravel with turnouts that primarily follows along the North Fork Wolf Creek riparian area for most of the route which flows into Wolf Creek Reservoir out of the project area. It is an enclosed route travelling along the valley bottom with steep ridgelines encompassing the sides, views are limited to the foreground, and rock outcrops are scenic adding to variety in the viewshed. The travel route is popular for dispersed recreational activities, camping along the creek in areas and for accessing Ladd Canyon Forest Road 43. Large tree character is seen along the travel route, the ponderosa pine stands are park-like and highly scenic with views into the stand. The viewshed is a mixture of natural appearing to slightly altered along the travel route. The vegetative character is a multi-storied coniferous stand intermixed with riparian vegetation.

Existing Scenic Stability Summary

The greatest hazard to scenery resources in this area are large stand replacement fires that would burn much more intensely due to the stocking levels, species compositions, ladder fuels and canopy closure that have developed over time, and large epidemics of insect or disease. The fire regime condition classes (FRCC) rate these factors and give an indication of the potential for fire intensity.

The considerations to the stability of scenery resources in this project area are project stand conditions related to departure from historical fire regimes and tree density levels to determine overstocked conditions. The condition of most of the project area is the higher end of FRCC 2 (Moderate) to a FRCC 3 (High) which is moderate to low scenic stability on a landscape scale, moderately to highly divergent from historical conditions. The majority of the project area under current stand conditions has high fuel loadings and densely stocked canopies when compared to historical loadings for the fire regime that it occurs in.

These two factors create a moderately low scenic stability for the project area.

Effects

Landscape Scenic Viewsheds and Analysis

The East Face Project area has been divided into four separate landscape areas based on landscape visibility, sensitivity levels and visual quality objectives for the scenic travel routes for assessing scenic effects. These four landscape areas are:

A. **Elkhorn Drive Scenic Byway (Forest Road 73) and Interstate 84**– Retention VQO Foreground, Retention to Partial Retention Middleground/Background
B. **Anthony Lakes Recreation Area -** Retention VQO Foreground and Middleground/Background
C. **Ladd Canyon Forest Road 43 to Anthony Lakes Recreation Area**– Partial Retention VQO to Modification VQO Foreground/Middleground
D. **North Fork Wolf Creek Forest Road 4315** – Partial Retention VQO to Modification VQO Foreground/Middleground

The direct and indirect effects of the East Face action alternatives have been analyzed for all four landscape areas. The Elkhorn Drive Scenic Byway and Anthony lakes Recreation Area will be discussed in depth below as they are the most sensitive of the four landscape areas. The analysis for the Ladd Canyon Road 43 and North Fork Wolf Creek Road 4315 effects will be summarized below, refer to the Scenery report in the East Face Analysis File for more specifics.

Methodology

The scenery effects analyses used for this report are those found in the Scenery Management Handbook #701, Appendix J. Scenery management is based on the classic aesthetic factors of form, line, color and texture, as well as the principles of sense of place. "Scenic integrity measures the amount of natural or socially valued appearance in a landscape along with the amount of visual disturbance that contrasts with and detracts from the appearance (the valued scenic character) existing at the time of measurement." "Scenic stability is an indicator of the ecological sustainability of the scenic character's valued attributes."(App. J Scenery Management)

Methods of Measuring Effects

- Amount of change seen on the landscape; shape, size and arrangement of fuels reduction units, removal of trees and harvest method, and location of fuels reduction units in a given viewshed and from fixed viewpoints.
- Consistency with Forest Plan standards and guidelines; the resulting scenic integrity level in the short term and long term (based on how well the vegetative and prescribed fire treatments meet the established Retention and Partial Retention VQO's).

Incomplete and Unavailable Information

Information necessary for evaluating scenery effects is sufficient.

Spatial and Temporal Context for Effects Analysis

Effects to scenery resources can be short term and long term. Short term is usually less than 5 years, and long term is 5 years to 50 years. Effects that are eliminated by the natural course of a single growing season are not considered effects because they are a so short lived. Most treatments have long term effects while the logging activities such as cable yarding, skidding and slash burning are usually short term effects lasting less than 5 years. The project analysis area is the area from which the proposed treatments can be visibly discerned. The analysis is done within the project boundary.

Important Interactions

Thinning trees and associated activities of road construction, temporarily opening closed roads, logging systems, and fuels treatments can affect the scenic resource by altering the naturally established form, line, color, and texture in a given viewshed. The natural landscape character and the existing scenic integrity level (condition) can be affected. Scenic impacts of the change depend on the interactions of the following:

1. Access to stands by existing roads and skid trails.
2. Harvest methods and silvicultural prescriptions.
3. Slash disposal methods.
4. Shape, size, and arrangement of treatment units.
5. Topographical relationship of treatment units to viewer's position and duration of view.
6. Existing landscape character and scenic integrity, the ability of the viewshed to absorb change.
7. Landscape visibility and location in relation to proposed treatment.

Visual absorption capability (VAC) indicates the relative ability of any landscape to accept human alteration without loss of landscape character or scenic integrity level (USDA FS, 1995, Landscape Aesthetics, C-1). The ability of a particular viewshed to absorb change is based on several factors including, but not limited to, soil color, texture of vegetation, slope, and degree of visual screening provided by landform, rockform, vegetative cover and percentage of existing alteration to the viewshed. Using VAC it is possible to rate the project on how easy or difficult it is to blend the activity into the surrounding landscape. VAC is rated in terms of high, medium, or low; high being the easiest to accomplish, low being the most difficult. In general, the East Face project area has a medium to high VAC rating due to an existing road system, existing mosaic texture vegetative patterns in many areas, and the diverse landform with rolling dissected valleys breaking up the continuous ridgelines. The exception is in the immediate foreground viewing areas of Anthony Lakes Recreation Area, developed recreation sites, and around Floodwater Flats special use cabins (tract) which would have a low VAC rating and would be very sensitive to changes.

Scenic effects within the East Face project area are quantified and interpreted based on how the alternatives change the existing landscape character and scenic integrity level. Landscape character refers to the naturally established landscape patterns that make each landscape identifiable or unique. Scenic integrity is the state of naturalness, or conversely, the state of disturbance created by human activities or alteration. The frame of reference for measuring scenic integrity levels is the valued attributes of the existing landscape character being viewed. The degree of scenic altered condition depends on the amount of changes seen from the Elkhorn Drive Scenic Byway (Forest Road 7300), Anthony Lakes Recreation Area, and key scenic locations along North Fork Wolf Creek Forest Road 4315 and Ladd Canyon travel route. The character of the landscape would be least affected when most of the existing trees are left intact. Landscape character changes will occur similarly to the scenic integrity. The focus of this scenic analysis is on the vegetative element of the landscape character.

For purposes of analysis, the following criteria are developed to rate the consequences of the alternatives from high landscape character and scenic condition to moderate landscape character and scenic condition to low landscape character and scenic condition. In the project area, where the Retention visual quality objective is designated high landscape character and scenic condition is desired, Partial Retention visual quality objective is Moderate and the Modification visual quality objective would fall in the low landscape character and scenic condition. The following table describes the scenic integrity rating criteria and landscape character associated with each.

Table 109 - Visual Description Of The General Appearance Of High, Moderate, Low And Very Low Landscape Character And Scenic Condition

Landscape Character/Scenic Condition	Visual Description
HIGH Landscape Character and Scenic Condition (Desired for all visually sensitive foreground and middleground areas) Retention Scenic Quality Objectives (VQO's)	Mosaic landscape patterns, less uniformity. High diversity of structures and variety of spaces. Light treatment to the landscape. Minimal skyline corridors, visible roads, and little mechanical disturbances. Alterations emulate natural appearing patterns. Open spaces with variety of patterns. Areas of dense, mosaic, and clumpy arrangement of textural patterns. Interesting landscapes. **Appears Unaltered.**

Landscape Character/Scenic Condition	Visual Description
MODERATE Landscape Character and Scenic Condition (Desired in foreground and middleground areas) Partial Retention Scenic Quality Objective (VQO)	Combination of mosaic and uniform landscape patterns. Some diversity of structure. Moderate variety of spaces and treatment to the landscape. A variety of natural to slightly altered scenic conditions. A variation of natural pattern and interest in the landscape. Some textural patterns and mosaic landscape character are retained. **Appears Slightly Altered.**
LOW Landscape Character and Scenic Condition (Preferred in other landscapes) Modification Scenic Quality Objective (VQO)	Combination of some mosaic and more uniform landscape patterns. Some diversity of structure. Some variety of spaces. Moderate to higher treatment to the landscape. A variety of natural to slightly altered to altered conditions. A variation of natural pattern and interest in the landscape. Some textural patterns are retained. **Appears Moderately Altered.**
VERY LOW Landscape Character and Scenic Condition (Not desirable in any landscape) Maximum Modification Scenic Quality Objective (VQO)	Uniform landscape patterns. Low diversity of structures, little variety of spaces, sameness. Heavy treatment to the landscape. Roads, skyline corridors, and mechanical disturbances dominate scenic conditions. Alterations do not appear natural, heavily altered conditions. Natural patterns are destroyed. Uninteresting, barren and sparse landscapes. **Appears Heavily Altered.**

The concept of treating different areas with various degrees of leave tree combinations, with the natural existing character provides diversity and variety in the landscape. Scenically, the treatment in the landscape would emulate and blend with nature. The success of the treatment depends on the number of trees left in a mosaic pattern. The structure or size of trees left is critical. In general, larger trees provide a strong vertical structure, creating stronger contrast and emphasizing the character of the area. A variety of openings interwoven throughout the landscape with the mosaic arrangement of leave trees would increase spatial diversity and identity of the area. Scenic quality is highest when a variety of trees and spatial patterns are retained.

No Direct, Indirect, or Cumulative Effects

The following activities associated with the East Face project are of such limited and constrained nature that they would have no effect on Scenery resources.

- Planting
- Snag Retention
- Whitebark Pine treatments
- Bridge Replacement
- Culvert Replacement

These activities and their effects will not be discussed further in the effects to Scenery.

Direct and Indirect Effects on Scenery

ALTERNATIVE 1 – No Action

The no action alternative would have no short term effects to scenic integrity, or scenic stability. Existing scenery integrity and scenic stability would remain the same.

The indirect long term effects related to the existing conditions and trends could be substantial. The overstocked stands are under greater and greater stress which is likely to lead to insect and disease epidemics. Fuel loads within the stands increase the hazards of stand replacement fire. All of these conditions would continue to degrade the scenic stability. In the event of a stand replacement fire the scenic integrity would likely be greatly reduced by uncharacteristic fire because the firefighting opportunities would be limited due to fuel conditions that effect flame lengths.

The No Action Alternative would maintain the existing range of Low, Moderate and High Landscape Character and Scenic Integrity (condition). Refer to the earlier section for the visual description of general appearance of Landscape Character and Scenic Condition in the important interactions section. In the short term, the landscape would remain as a mosaic pattern of natural appearing to slightly altered and altered landscape character and scenic condition as it currently exists. The vegetative component of the landscape would continue to grow through the pattern of natural succession with a high risk of future disturbance, primarily wildfire. Forest succession that has resulted from fire suppression shapes forest landscapes, the highly textured tree density patterns would continue to dominate the landscape character where they exist. Scenic quality of landscape character and scenic condition would have very low human intervention with nature taking its course. Disturbance to the existing landscape that would occur through mechanical disturbance related to activities of tree removal and prescribed burning would not occur. The opportunity to enhance scenic quality, improve the forested setting and enhancement of large tree character, Quaking stands and Whitebark pine stands would not be done. A transitional approach to treating the landscape by moving the landscape character towards a more sustainable forest setting that is more resilient to fire; disease and/or bug infestations would not be done. Consequently, the risk of large-scale disturbance patterns, which are out of their natural disturbance regime, would remain as existing.

The high fuel loadings have the potential to result in a sudden change to the landscape character that could result from a wildfire that would be seen as a burned off area or the landscape would continue to be affected by diseased tree and associated tree mortality. The current insect and disease infestations could continue to affect the landscape character visually from a healthy green canopy to one that is predominately brown, the insect and disease would spread out of the areas that are currently affected. In the case of wildfire, the landscape character could dramatically change from a forested green setting to an area dominated by the visual evidence of wildfire. Fire intensity patterns would probably range from low to moderate to high viewed in the foreground and middleground from the travel routes. The visual effects of a large scale wildfire would change the landscape character from a highly green textured pattern to a black, brown, and green interwoven landscape pattern. Wildfire visual characteristics would be dominant and evident for 5 to 10 years or more; snags would be created as a result of wildfire. The snags would be dominant for at least 5 years, and then begin to fall and create a jackstraw effect viewed along the travel corridors and would appear visually out of character for a natural appearing landscape. In general, natural forest disturbances that result in extensive areas of dead or dying trees are perceived negatively. There would be some risk to losing the highly valued larger Ponderosa Pine, Western Larch and Douglas-fir if a wildfire were to occur. A sustainable green scenic forest may not be maintained over time because of this high disturbance risk related to high fuel loadings and potential for catastrophic wildfire.

Summary of Effects

The no action alternative would not address the vegetation conditions that are the beyond the historic range of variability. Alternative 1 would not reduce the risk uncharacteristic wildfire that could cause undue effects to scenery, nor will it move the stands toward the desired condition.

ACTION ALTERNATIVES

Effects Common to all Action Alternatives

Vegetation removal, management activities and associated transportation changes (temporary roads) would have a direct effect on the landscape character and scenic integrity (condition). There are two primary aspects that affect scenic quality, 1) vegetation treatment proposed and implementation of the vegetation treatment (logging systems) and 2) fuels treatments consisting of prescribed fire and implementation of surface fuel treatments.

Landscape character changes would occur similarly to the scenic integrity. Landscape character is the naturally established landscape pattern that makes each landscape identifiable or unique. For this analysis, focus will be on the vegetative element of the landscape character and the visual effects that would result from proposed thinning, reducing tree density, and visual effects of fuels pile burning and prescribed fire. The dissected landform of the East Face project area has several stream lined valleys that rise to the surrounding ridgelines. This variety in landform provides the opportunity to spatially blend in treatment.

Scenic integrity is measured as the amount of human caused deviation in form, line, color, and texture of a landscape; it serves as a frame of reference for measuring scenic integrity levels based on the valued attributes of the existing landscape character being viewed. In the project area, scenic integrity effects would be seen as the result of changes to landscape character caused by implementation of the vegetation management activities and amount of ground disturbance or vegetation removal in foreground areas of identified travel corridors, and middleground or background views of the area from travel routes. Examples of scenic integrity effects include actions such as new skid trails, new or reconstructed temporary roads, fresh tree stumps and slash, blackened tree boles, disturbance to the ground resulting from mechanical activity of cutting trees, and changes to the textured landscape pattern. Overall, the reduction of fuels and thinning to enhance large tree growth would benefit long term scenic quality by providing a more stable, sustainable forest which is typical of vegetative character types found in the Elkhorn Mountains landscape character type.

Important design measures to reduce the unavoidable visual effects in sensitive areas include:

- using special markings to provide variable spacing of leave trees
- leaving vegetative texture along the identified travel routes and destination areas
- rehabilitating ground disturbed areas where they would be seen in foreground
- cutting stumps low to the ground in seen areas of foreground along Elkhorn Scenic Byway and Anthony Lakes Recreation Area
- locating landings outside of seen areas along the Elkhorn Drive Scenic Byway and Anthony Lakes Recreation Area, and/or leaving vegetative screening

The following is a summary of general effects common to the project area:

Landscape Character and Scenic Integrity Positive Elements

1. Enhancement of landscape character would be done by thinning and reducing dense stands of trees, providing variety in spatial distribution of plant communities and moving towards more variety in age classes. Where they exist, large diameter trees would be retained and would stand out as more dominant after removing small trees around them; views into the forest would be more open.
2. Enhancing large Ponderosa pine and Western larch trees by removing small encroaching vegetation around them.
3. Enhancement of Aspen and Whitebark Pine restoration would increase scenic quality and variety in the landscape.
4. The proposed management activities begin the transition of moving the forest setting on a landscape scale towards the sustainable landscape character by reducing natural fuels.

5. Utilizing existing landings, roads, fire lines and natural fuel breaks as proposed would reduce further visual impacts associated with implementation. In these areas, visual impacts are contained in areas already impacted rather than introducing new impacts.
6. Treatment methods of thinning from below, creating small patch openings and non-commercial thinning are texture changes to the existing dense to mosaic textured landscape and would blend in well.
7. On the landscape scale, by using prescribed fire in a timely manner and in phased treatments, it is expected to reduce the future risk of a potential high intensity wildfire that would affect scenic quality.
8. Fire hazard would be reduced and forest vegetation health and resiliency would be improved around developed recreation facilities of Baker Valley Scenic Viewpoint, Dutch Flat TH, Van Patten Lake TH, Elkhorn Crest TH (Elkhorn Drive Scenic Byway), Anthony Lakes Ski Resort and Recreation Area and Floodwater Flats Recreation Residence tract.

Landscape Character and Scenic Integrity Potential Negative Elements

1. Stumps would be more evident in some areas of foreground of travel routes and dispersed sites. Coarse woody debris (slash) would be seen along travel routes before under burning, hand or machine piling, and pile burning. This would create a short term negative visual effect until the material is burned, decomposes or is softened by early successional grasses and forbs. The proposed under burning and pile burning may not entirely reduce the slash.
2. Coarse woody debris (slash) would be seen along Baker Valley Scenic Viewpoint, Dutch Flat TH, Van Patten Lake TH, Elkhorn Crest TH (Elkhorn Drive Scenic Byway), Anthony Lakes Ski Resort and Recreation Area and Floodwater Flats Recreation Residence tract and dispersed recreation sites before under burning, hand or machine piling, and pile burning is accomplished. This would create a short-term negative visual effect until the material is burned, decomposes or is softened by early successional grasses and forbs. The proposed under burning and pile burning may not entirely eliminate the slash.
3. Prescribed fire has the potential to create larger forms (openings) in the landscape than intended, possibly burn out of the area intended, and/or to burn trees that are desired to be retained for scenic quality or other resource objectives.

Common Effects of Specific Prescriptions/Logging Systems

The following describes the general effects of each prescription on scenery resources. Detailed descriptions of the following can be found in the Common Elements section of the EA:

- Vegetation treatment types and acreages
- Fuels treatment types and acreages
- Transportation system changes.

Sanitation Harvest (HSA)

Removing diseased and insect damaged trees to promote ponderosa pine and western larch trees would be desirable to enhance scenic quality and a sustainable landscape character associated with those stands. This treatment would create a texture change in the landscape viewed from foreground and middleground.

Commercial Thinning Harvest (HTH)

Intermediate thinning would remove understory trees to address uncharacteristic species composition, under-represented stand structures and unsustainable tree densities. These treatments would decrease competition and increase growth rates in the residual stand. Thinning from below would also decrease the risk of uncharacteristic disturbance from insects, disease and wildfire by promoting resistant species and increasing crown spacing.

Thinning would cut across a range of tree diameters to address species composition and density. Selecting healthy ponderosa pine and western larch for retention would result in openings at naturally random intervals. Thinning from below opens up the stands by removing the smallest diameter trees, this provides greater viewing distances into the stand which is preferable. The appearance of the stands would be improved by retaining the largest healthier trees, especially Ponderosa pine and Western larch. There would be a variation of spacing between the prescriptions that retain a variety of density patterns and species compositions. Variable density thinning does not create openings that area visible from middleground or background distances. The effects of this prescription would not reduce scenic integrity.

The reduction of tree stocking levels would improve the resilience of the stands by reducing stress and ladder fuels, which reduces the risk of high insect and disease epidemic occurrence, and stand replacement wildfire. These are benefits that contribute to the improvement of scenic stability when carried out at a landscape scale.

Shelterwood Harvest (HSH)
Shelterwood harvest prescriptions create a more open landscape character where the ground is dominating visually with large scattered overstory trees located in a wide spatial pattern that appears altered in the short and long term until the understory becomes established. The size of openings would not be larger than 40 acres.

Partial Removal Harvest (HPR)
Partial overstory removal would create a texture change viewed from foreground, middleground and background. This treatment would create stumps, slash and soil disturbance that would be visible from foreground views. These effects would be minor within the first one to two years. As regrowth of shrubs and grasses occur these effects would be significantly reduced. Overstory removal does not create openings that area visible from middleground or background distances. The effects of this prescription would not reduce the scenic integrity of the units.

Improvement harvest (HIM)
Removing diseased and insect damaged trees would be desirable to enhance scenic quality and a sustainable landscape character associated with those stands. This treatment would create a texture change in the landscape viewed from foreground and middleground.

Fuels Harvest (HFU)
Removing ladder fuels and excess down dead woody material to promote ponderosa pine and western larch trees would be desirable to enhance scenic quality and a sustainable landscape character associated with those stands. This treatment would create a texture change in the landscape viewed from foreground and middleground.

Patch Openings (HPO)
This prescription would create small canopy openings (4 to 6 acres) focusing on promoting pine and larch to improve stands resilience to wildfire and insect and disease outbreaks. Where patch openings are done trees are cut in small groups, and new age classes are established in the even-aged lodgepole pine. Variety in the landscape would be an enhancement for scenic quality by promoting growth of western larch and western white pine species. This treatment would create a mosaic texture change to the landscape character viewed from foreground, middleground and background.

Precommercial thinning (PCT)
This prescription reduces stocking levels to promote growth of desirable species, reduce disease, the threat of future insect outbreaks and ladder fuels that increase fire intensity and the occurrence of crown

fires. This would result in a texture change to the existing highly established textured patterns in the dense forest stands resulting in a more varied pattern.

Harvest Methods

Commercial harvest would include ground-based harvesting utilizing a tractor or skidder that would operate on designated trails with selected spacing criteria in combination with whole tree yarding on slopes up to and including 35 percent. Skyline cable yarding would use leave tops attached yarding on slopes exceeding 35 percent. Logs would be either partially or fully suspended to reduce soil disturbance. Helicopter harvesting would occur in areas inaccessible by existing roads or in visually sensitive areas along Elkhorn Drive Scenic Byway on steeper grounds.

All of the commercial and non-commercial fuel reduction activities would create stumps. A ground based logging system would create visible effects for the first year including ground disturbance, slash and debris, but after a growing cycle these effects would be negligible. Skyline cable yarding systems have the potential to create lines in the landscape from corridors. The corridors would be designed to limit visibility of the linear effects by softening linear edges with feathering or using irregular edges, leaving clumps to create blended edges along units or roads. Helicopter logging systems have the least visual impact and would not create ground disturbance associated with ground based systems.

Fuels Treatments

Fuels treatments proposed under this project are designed to move stands from their current structure and development trajectory to conditions more indicative of natural disturbance regimes under pre-Euro-American influences. Strategies for restoring forest structure and function include thinning live trees, and burning surface fuels to reduce the risk of severe crown fires.

On the landscape scale, by using prescribed fire in a timely manner and in phased treatments, it is expected to reduce the future risk of a potential high intensity wildfire that would affect scenic quality. Prescribed fire has the potential to create larger forms (openings) in the landscape than intended, possibly burn out of the area intended, and/or to burn trees that are desired to be retained for scenic quality or other resource objectives. The benefits of reducing fuels in the project area are complimentary for sustaining scenic quality.

Prescribed Burn Units - This treatment would reintroduce fire to a fire dependent ecosystem; lessening the impact of a future high intensity wildfire and improving forage and browse quality for big game. Fire intensities would be kept low during implementation to minimize fire and fire effects in the overstory canopy. The effects to scenery are limited to foreground view effects of stumps, and slash. A growing season would reduce the effects to the remaining scorched tree trunks, and dead saplings. Fire, at low intensity is a natural occurrence in this area, and its effects do not degrade the scenic quality. This treatment can greatly improve a stands resiliency to large stand replacement fire which can affect the scenic quality. Low intensity prescribed burning would occur after these treatments in areas that support fire tolerant ecosystems and drier biophysical environments. With the treatments scattered over a large landscape scale, direct effects to scenery would be minimal and short term. Removal of smaller trees opens view into stands.

Fuels Reduction Mechanical (WFM) - This would result in a texture change to the existing highly established textured patterns in the dense forest stands resulting in a more varied pattern.

Fuels Reduction Hand Work Only (WFH) - This would result in a texture change to the existing highly textured patterns in the dense forest stands resulting in a more varied pattern.

Roadside Hazard Trees

Danger trees would be felled and removed along all haul routes used for timber sale activity and around campgrounds, trails, and trailheads in the project area. Removing large trees would create new stumps in foreground areas of dispersed recreation sites and scenic roads, but the scale would be small and maintain scenic quality.

A. Elkhorn Drive Scenic Byway (Forest Road 73) and Interstate 84

(Retention VQO Foreground (FG), Retention to Partial Retention VQO Middleground/Background)

ALTERNATIVE 2

The treatments in Alternative 2 would serve to improve the overall scenic stability by addressing the conditions that put scenic attributes at risk of stand replacement fire and insect and disease epidemics. It is not expected that the risk would be eliminated. However, the treatments would improve opportunities for firefighters to minimize the fire effects. The treatments would improve the long term scenic integrity, by opening the stands up for increased visibility and visual diversity. Forest structure would be moved toward conditions historically present and the risk of high severity disturbance on the landscape, including within riparian area, would be reduced. Logging activities would cause short term effects that would reduce scenic integrity for a period of 1-3 years. Ground based logging would create visible effects for the first year including ground disturbance, slash and debris, but after a growing cycle these effects would be negligible. Skyline cable yarding systems have the potential to create lines in the landscape from corridors. The corridors would be designed to limit visibility of the linear effects by softening linear edges with feathering or using irregular edges, leaving clumps to create blended edges along units or roads. In areas where helicopter logging systems are used, effects would be minimal. See effects common to all action alternatives.

Alternative 2 would improve forest health, resiliency to disturbance, reduce the risk of wildfire within the wildland urban interface, and provide economic benefit to the local economy. Alternative 2 would treat 17,098 acres with a combination of commercial (6,722 acres) and non-commercial (10,376 acres) harvest of the 47,621 acre project area. These treatments would improve scenic stability from moderately high to low where “all dominant scenery attributes of the valued scenic character are present and are likely to be sustained” (pg19, App. J). The appearance of the stands would be improved by making them appear healthier. These treatments would create stumps, slash and soil disturbance would be visible from foreground views. These effects would be minor within the first one to two years. As regrowth of shrubs and grasses occur these effects would be noticeably reduced. These treatments would not create openings that would be visible from middleground or background distances. The effects of this prescription would not reduce the scenic integrity of the viewsheds as they are expected to be negligible within 2-3 years.

The immediate foreground (up to 300’ distance zone), FG (up to ½ mile distance zone) and middleground (up to 4 miles distance zone) of the Elkhorn Drive Scenic Byway travel route and background views from Interstate 84 is highly sensitive for any new visual impacts, maintaining large trees and reducing the visual effects of logging systems and activity along the travel route is a high priority.

Alternative 2 would increase visibility into stands along Elkhorn Drive Scenic Byway from the forest boundary to Anthony Lakes Recreation Area by removing trees in the foreground enhancing large tree character, opening up the mid canopy, and creating greater foreground diversity. The density and resulting canopy closure will vary by plant association with the driest types at a lower density. This would result in a texture change to the existing highly established textured patterns in the dense forest stands resulting in a more varied pattern. The commercial thinning treatments would leave the pine and larch species that have the desired large tree character, and greater fire resiliency. This effort would improve the scenic character and the scenic stability of the area. Landscape character changes would be seen as thinned out stands of trees and a more open forested canopy character. Alternative 2 would improve species composition, stand density, and reduce ladder fuels and canopy closure.

These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative. The following discussion illustrates the specific effects of the vegetation management units and fuels treatments unique to the Elkhorn Drive Scenic Byway and Interstate 84.

Foreground/Middleground Elkhorn Drive Scenic Byway – Management Areas (MA) 1 and 16 (Affected Units: 118-133, 301, and 425)

There are vegetation management units and fuel treatments proposed in the foreground and middleground area of the Elkhorn Drive Scenic Byway. Treatment is predominately hand work in immediate foreground/foreground and ground based logging systems with some skyline and helicopter at the lower to upper elevations. Existing vegetative screening and narrowed views along the narrow canyon road corridor limit the viewer's field of vision to foreground in most areas.

This area of the viewshed is located from the forest boundary to section 11 where the travel route straightens out, including an isolated parcel just outside the forest boundary. Eighteen units combine to treat approximately 652 acres along the lower 1/3 of the winding steep canyon roadside. The treatment proposed includes 293 acres Improvement Thinning (HIM), 86 acres Commercial Thinning (HTH), 37 acres Fuels Harvest (HFU), and 122 acres Sanitation Harvest (HSA). Non-commercial treatments include 87 acres fuels reduction by handwork (WFH) and 27 acres of mechanical fuels reduction (WFM).

Most commercial treatment would be done with tractor based systems; skyline logging systems would be done in 4 units (120, 122, 123, and 127) and helicopter logging in 2 units (132,133). Approximately 3/4 of the proposed treatment is a mix of improvement thinning and commercial thinning along the travel route with tractor based logging systems or skyline logging systems. The remainder of the treatment is sanitation harvest with tractor or helicopter logging systems. A small area along the roadside would have fuels reduction hand work only. A temporary road is proposed near the powerline corridor in unit 120 and in unit 123. The visual effects along this segment of the travel route would range from thinning activities on both sides of the road with areas of untreated corridors near riparian areas. The winding steep road narrows the view to foreground. The powerline corridor crosses the road in one area before eventually paralleling the travel corridor as the road straightens out following the valley landform. Refer to the Common Effects of Specific Prescriptions/Logging Systems for the visual effects of each treatment type.

Skyline corridors have the potential to introduce lines in the viewshed, feathering edges by leaving clumps and aligning the cable corridors to blend in the landscape would be done. Stumps would be more evident in some areas of foreground and middleground and coarse woody debris (slash) would be seen along the travel route beforehand or machine pile and burning occurs. Using helicopter logging systems, existing roads and designated skid trails with tractor ground based logging minimizes impacts. Locating skylines to angle away from viewing areas and feathering edges of corridors would help to blend in edges. Hand pile and burn pile techniques reduce visual impacts in site specific destination areas.

All proposed treatments would cause textural changes to the landscape character, the least impact to the existing highly textured landscape patterns. The powerline corridor and highway would benefit from fuels reduction making the access in and out of Anthony Lakes safer and protecting the powerline corridor from potential uncharacteristic wildfire.

Treatments proposed in this area under Alternative 2 meet Retention VQO with high scenic integrity.

Foreground/Middleground Elkhorn Drive Scenic Byway – MA1, 3, 6, 15, and 16
(Affected Units: 134, 135, 138, 139, 302, 306-308, 357-359, and 431)

There are vegetation management units and fuel treatments proposed in the foreground and middleground area of the Elkhorn Drive Scenic Byway. Treatment is predominately hand work in immediate foreground/foreground with some skyline and helicopter at the upper elevations. Existing vegetative screening and narrowed views along the narrow canyon road corridor limits the viewer's field of vision to foreground in most areas except for Baker Valley Viewpoint which allows a distant view out of the project area.

This area of the viewshed is located from section 11 where the travel route straightens out to the Anthony Lakes Recreation Area. The 12 units combine to treat approximately 1,096 acres along the 4 ½ miles of the roadside. The treatment proposed includes 241 acres improvement thinning (HIM), 52 acres fuels harvest (HFU) and Non-commercial treatments include 221 precommercial thinning (PCT), 528 acres fuels reduction by hand (WFH) and 54 acres mechanical fuels reduction (WFM).

All commercial treatment would be done with helicopter logging in unit 134 along the first mile and ½ of the foreground. The rest of the treatment would be non-commercial handwork along both sides of the foreground to Van Patten Lake area then treatment would only be done on the north side of the highway to Anthony Lakes Recreation Area. The visual effects would be minimal along the travel route. No new linear corridors would be introduced from logging systems or temporary roads, opened roads. Refer to the Common Effects of Specific Prescriptions/Logging Systems for the visual effects of each treatment type.

Helicopter logging systems and handwork are light touches on the ground. Ground disturbance would be minimal, there would not be skid trails or corridors associated with roads and skyline logging systems. Stumps would be more evident in some areas of foreground and middleground and coarse woody debris (slash) would be seen along the travel route beforehand pile and burning occurs.

The powerline corridor and highway would benefit from fuels reduction making the access in and out of Anthony Lakes safer and protecting the powerline corridor from potential uncharacteristic wildfire.

Treatments proposed in this area under Alternative 2 meet Retention VQO with high scenic integrity.

Background from I-84 – MA1 and 3
Affected Units – 3-7, 27-34, 41, 42, 72-81, 100-106, 108-117, 141, 142, 145, 303-305, 321, 323, 324, 327-340, 345-356, 360-364, 368, 372-374, 382-394, 417-421, and 429

These units combine to treat the background viewed from I-84. At that distance, the units are viewed in the larger landscape scale and blend to create one mosaic textural pattern change viewed from Shaw Mountain viewing south to High Mountain and Antone Butte.

In the north end of the project near Summit Spring Hill the background viewed from I-84 and the community of North Powder, the landscape character would be a texture change associated with fuels reduction hand work and mechanical work, and pre-commercial thinning. No lines would be introduced with new or temporarily opened road corridors or skyline logging systems.

In the middle area from Wolf Creek drainage to Gorham Butte, the background view from I-84 and the community of North Powder, the landscape character would be maintained with non-commercial thinning handwork and mechanical work. There would be several commercial thinning units done around North

Fork Anthony Creek with tractor logging systems and some skyline. This would not be noticeably visible from the background viewing distance zone.

The south end of the project area would have pre-commercial thinning, and non-commercial hand work. Areas of Improvement Thinning would be intermixed in with the non-commercial treatment and blend in to the landscape. This would result in a texture change to the existing highly established textured patterns in the dense forest stands resulting in a more varied pattern. Refer to the Common Effects of Specific Prescriptions/Logging Systems for the visual effects of each treatment type.

All proposed treatments would cause textural changes to the landscape character, the least impact to the existing highly textured landscape patterns.

Treatments proposed in this area under Alternative 2 meets Retention to Partial Retention VQO's and High to Moderate Scenic Integrity viewed from I-84 and the community of North Powder.

Middleground/Background View from I-84 – BLM lands
Affected Units – 3, 4, 5, 417-421

The BLM units are located on the north end of the project area in middleground and background views from I-84 and the community of Union. The proposed treatment units are primarily non-commercial treatment consisting of 8 units totaling 589 acres. There would be 185 acres of pre-commercial thinning (PCT), 333 acres of mechanical fuels reduction (WFM), 33 acres of commercial thinning (HTH), and 38 acres of partial removal harvest (HPR).

In the north end of the project near Summit Spring Hill the background viewed from I-84 and the community of North Powder the landscape character would be a texture change associated with fuels reduction hand work and mechanical work, and pre-commercial thinning. No lines would be introduced with new or temporarily opened road corridors or skyline logging systems. Refer to the Common Effects of Specific Prescriptions/Logging Systems for the visual effects of each treatment type.

All proposed treatments would cause textural changes to the landscape character, the least impact to the existing highly textured landscape patterns. Treatments proposed in this area under Alternative 2 meets Retention to Partial Retention VQO's and High to Moderate Scenic Integrity viewed from I-84 and the community of North Powder.

Summary of Effects

Alternative 2 would move stands toward desired future conditions which are within the historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity to a minimum, meeting all standards.

ALTERNATIVE 3

The direct and indirect effects of Alternative 3 would be the same as Alternative 2 except amount of commercial thinning density and non-commercial thinning/fuels reduction would be reduced. There would be no treatment in allocation old growth habitat, unroaded areas, no construction of temporary roads or overgrown roads and no regeneration harvests or treatment within connective corridor units. Reference the effects of specific prescriptions in the Common Elements section. From a scenery perspective, Alternative 3 would maintain a higher level of scenic integrity after implementation due to maintaining more color and texture viewed in the foreground and not constructing a temporary road near the powerline corridor. Overall, there would be less treatment in along the Elkhorn Drive Scenic Byway, especially in the segment from the forest boundary to section 11 and the area between Van Patten Lake

TH access road to the Anthony Lakes Recreation Area. The view of the middleground/background from I-84 would be the same as Alternative 2.

Units Dropped: 128, 118, 119, 120, 121, 122, 123, 124, 129, 131, 133, 138, 139

Units Reduced: 134, 307

Alternative 3 would treat 13,654 acres with a combination of commercial (3,879 acres) and non-commercial (9,775 acres) harvest of the 47,621 acre project area to improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant would improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Summary of Effects

Alternative 3 would move stands toward desired future conditions which are within historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity at a high level. Reopening overgrown roads and constructing temporary roads would not occur; therefore, further reducing visual effects of introducing linear corridors. Treatments proposed in this area under Alternative 3 meet VQOs with high to moderate scenic integrity.

ALTERNATIVE 4

The direct and indirect effects of Alternative 4 would be the same as Alternative 2 except amount of commercial thinning density and non-commercial thinning/fuels reduction would be reduced. There would be no treatment in allocation old growth habitat, unroaded areas, no construction of temporary roads or overgrown roads and no regeneration harvests or treatment within connective corridor units. Reference the discussion under Alternative 2 and the Common Effects section in the Landscape Viewsheds – Alternative 2 Elkhorn Drive Scenic Byway & Interstate 84 for a description of the scenic effects. Overall, the treatment along the Elkhorn Drive Scenic Byway would be the same since this is all located in Priority 1 areas. The view of the middleground/background from I-84 would be the same as Alternative 2 since most of the area is along a WUI, Priority 1 area.

Units Dropped: none

Units Changed: none

Alternative 4 would treat 16,500 acres with a combination of commercial (2,844 acres) and non-commercial (13,656 acres) harvest of the 47,621 acre project area to improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Summary of Effects

Alternative 4 would move stands toward desired future conditions which are within historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity at a high level. Treatments proposed in this area under Alternative 4 meet VQOs with high to moderate scenic integrity.

ALTERNATIVE 5

The direct and indirect effects of Alternative 5 would be the same as Alternative 2 except roads would be open longer to accommodate biomass opportunities in the non-commercial thinning/fuels reduction units. Reference the chart for specific units in the Landscape Viewsheds – Alternative 2 Elkhorn Drive Scenic Byway & Interstate 84 for a description of the scenic effects. From a scenery perspective, Alternative 5 would remove more fuels along the foreground of Elkhorn Drive Scenic Byway if biomass removal is done. Overall, the treatment along the Elkhorn Drive Scenic Byway would be the same as Alternative 2 with more fuels removal done. The view of the middleground/background from I-84 would be the same as Alternative 2.

Units Dropped: none

Units Changed: 119, 120, 121, 122, 123, 124, 128, 130, 131, 132, 133, 134

Alternative 5 would treat 18,036 acres with a combination of commercial (10,221 acres) and non-commercial (7,815 acres) harvest of the 47,621 acre project area to improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Summary of Effects

Alternative 5 would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity at a high level while removing more fuels along the foreground area of Elkhorn Drive Scenic Byway. Treatments proposed in this area under Alternative 5 meet VQOs with high to moderate scenic integrity.

B. Anthony Lakes Recreation Area

(Retention FG/MG)

ALTERNATIVE 2 – (Affected Units – 309-312)

The immediate foreground (up to 300’ distance zone), foreground (up to ½ mile distance zone) and middleground (up to 4 miles viewing distance) of the Anthony Lakes Recreation Area and Floodwater Flats is highly sensitive for any new visual impacts. Maintaining large trees and minimizing visual impacts is important.

There are 4 vegetation management units and fuel treatments proposed in the immediate foreground, foreground and middleground area of the Anthony Lakes Recreation Area and Floodwater Flats residential tract. The proposed treatment units are primarily non-commercial treatment consisting of 75 acres of pre-commercial thinning (PCT) and 1,091 acres of hand work fuels reduction (WFH).

All treatment is located in 2 units (311 and 312) located around the main travel corridor of Elkhorn Drive Scenic Byway and north of Anthony Lake and Anthony Lake CG. The treatment would be highly visible around Floodwater Flats as a high priority to reduce fuels and create a more safe fire resistant forested landscape. The visual effects along this segment of the travel route would range from thinning activities on both sides of the road with areas of untreated corridors near riparian areas. Using existing roads and designated skid trails minimizes impacts. Hand pile and burn pile techniques reduce visual impacts in site specific destination areas. Refer to the Common Effects of Specific Prescriptions/Logging Systems for the visual effects of each treatment type.

Alternative 2 would increase visibility into stands along the Elkhorn Drive Scenic Byway and Floodwaters Flats by opening up the mid canopy and creating greater foreground diversity. The pre-commercial thinning and commercial harvest treatments would leave the pine and larch species that have the desired large tree character, and greater fire resiliency. This effort would improve the scenic character and the scenic stability of the area. Alternative 2 would improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Treatments under Alternative 2 meet Retention to Partial Retention VQO's and High to Moderate Scenic Integrity viewed from Anthony Lakes Recreation Area and Floodwater Flats.

Summary of Effects

Alternative 2 would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity to a minimum, meeting all standards.

ALTERNATIVE 3

The direct and indirect effects of Alternative 3 would be the same as Alternative 2 except amount of non-commercial thinning/fuels reduction would be reduced. There would be no treatment in allocation old growth habitat, unroaded areas, no construction of temporary roads or overgrown roads and no regeneration harvests or treatment within connective corridor units. Reference the chart for specific units in the Landscape Viewsheds – Alternative 2 Anthony Lakes Recreation Area for a description of the scenic effects. From a scenery perspective, Alternative 3 would be the same as Alternative 2, the only difference is unit 310 would be dropped. The result would be less textural changes noticed from a middleground view from Anthony Lakes Ski Area.

Units Dropped: 310
Units Reduced or changed: none

Alternative 3 would treat 13,654 acres with a combination of commercial (3,879 acres) and non-commercial (9,775 acres) harvest of the 47,621 acre project area to improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Summary of Effects

Alternative 3 would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity at a high level.

ALTERNATIVE 4

The direct and indirect effects of Alternative 4 would be the same as Alternative 2 except amount of commercial thinning density and non-commercial thinning/fuels reduction would be reduced. There would be no treatment in allocation old growth habitat, unroaded areas, no construction of temporary roads or overgrown roads and no regeneration harvests or treatment within connective corridor units. Reference the chart for specific units in the Landscape Viewsheds – Alternative 2 Anthony Lakes Recreation Area for a description of the scenic effects. From a scenery perspective, Alternative 4 would maintain a similar level of scenic integrity as Alternative 2 after implementation. Overall, the treatment around the Anthony Lakes Recreation Area would be the same since this is all located in Priority 1 areas with the exception of unit 310 which would be priority 2.

Units Dropped: none
Units Changed: 310

Alternative 4 would treat 16,500 acres with a combination of commercial (2,844 acres) and non-commercial (13,656 acres) harvest of the 47,621 acre project area to improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Summary of Effects

Alternative 4 would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity at a high level.

ALTERNATIVE 5

The direct and indirect effects of Alternative 5 would be the same as Alternative 2 except roads would be open longer to accommodate biomass opportunities in the non-commercial thinning/fuels reduction units. Reference the effects described for Alternative 2 Anthony Lakes Recreation Area and the Common Effects section for a description of the scenic effects. From a scenery perspective, Alternative 5 would remove more fuels around the foreground of Anthony Lakes Recreation Area if biomass removal is done. Overall, the treatment around Anthony Lakes Recreation Area would be the same as Alternative 2 with more fuels removal done.

Alternative 5 would treat 18,036 acres with a combination of commercial (10,221 acres) and non-commercial (7,815 acres) harvest of the 47,621 acre project area to improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Summary of Effects

Alternative 5 would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity at a high level while removing more fuels around Anthony Lakes Recreation Area.

C. Ladd Canyon Forest Road 43 to Anthony Lakes Recreation Area

ACTION ALTERNATIVES

Foreground/ Middleground of Ladd Canyon Road 43 – MA1 and 3

The immediate foreground (up to 300' distance zone) and FG (up to ½ mile distance zone) of Ladd Canyon Forest Road 43 to Anthony Lakes Recreation Area is moderately sensitive for any new visual impacts and maintaining large trees, diversity of vegetation are important.

Alternatives 2, 3, 4 and 5 would increase visibility into stands along the Ladd Canyon Forest Road 43 by opening up the mid canopy and creating greater foreground diversity. The partial removal and commercial harvest treatments would leave the pine and larch species that have the desired large tree character, and greater fire resiliency. This effort would improve the scenic character and the scenic stability of the area. All of the action alternatives would improve species composition, stand density, and reduce ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

All proposed treatments would cause textural changes to the landscape character, the least impact to the existing highly textured landscape patterns with one area of new more open landscape patterns with the shelterwood harvest. Treatments in all action alternatives in this area would meet Partial Retention to Modification VQO with Moderate Scenic Integrity.

Foreground/ Middleground of Ladd Canyon Road 43 – MA1, 3A, and 16

The treatment proposed along this section of the travel route, treatment is very light on the ground with mainly non-commercial treatments of pre-commercial thinning and fuels reduction (WFM, WFH) proposed. Refer to the Common Effects of Prescriptions/Logging Systems section for the effects of these treatments. Design criteria and mitigation measures for units 312 and 313 would ensure protection of scenic values near the Anthony Lakes Recreation Area.

All proposed treatments would cause textural changes to the landscape character, the least impact to the existing highly textured landscape patterns. Treatments proposed under the action alternatives in this area would meet Retention VQO with High Scenic Integrity. The action alternatives would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity to a minimum, meeting all standards. More of this happens under Alternatives 5, 2 and 4 respectively, than under Alternative 3 where overall, there would be less treatment along the Ladd Canyon Forest Road 43 and opportunities to improve the scenic quality within dropped units would be foregone in this alternative.

D. North Fork Wolf Creek 4315

ACTION ALTERNATIVES

As with the other scenic landscapes the action alternatives would increase visibility into stands along the North Fork Wolf Creek FR 4315 by opening up the mid-canopy and creating greater foreground diversity. The partial removal and commercial harvest treatments would leave the pine and larch species that have the desired large tree character, and greater fire resiliency. This effort would improve the scenic character and the scenic stability of the area as well as improving species composition, stand densities, and reducing ladder fuels and canopy closure. These prescriptions would improve the scenic character by moving stands toward the historic range of variability. More open stands of species compositions that are more fire resistant will improve the scenic stability. See previous section on summary of general effects for positive and negative effects for landscape character and scenic integrity in the proposed action alternative narrative.

Key scenic areas along this road system are the foreground views immediately adjacent to the 4315 in units 22 and 377 which are dominated by large old ponderosa pine. Treatment would occur on the north side of the travel route from unit 377 for approximately 1 mile with a light touch on the ground on both sides of the road. At the bend in section 30, treatment is proposed in the foreground and middleground on the south side of Wolf Creek FR 4315. Design criteria (retention of large trees) and mitigation measures (low stumps, etc.) for these units would ensure protection of scenic values in this area.

All proposed treatments would cause textural changes to the landscape character, the least impact to the existing highly textured landscape patterns. Treatments proposed under all action alternatives meet Partial Retention VQO with Moderate to High Scenic Integrity and would move stands toward desired future conditions which are with historic range of variability, and reduce the risk of uncharacteristic fire, while keeping effects to scenic integrity to a minimum, meeting all standards.

Table 110 - Comparison of Effects by Alternative for Visual Quality Objective and Scenic Stability

VQO's/SIO's	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Retention	Meets VQO	Meets VQO	Meets VQO	Meets VQO	Meets VQO
Partial Retention	Meets VQO	Meets VQO	Meets Higher VQO	Meets VQO	Meets VQO
Modification	Meets VQO	Meets VQO	Meets VQO	Meets VQO	Meets Higher VQO
Overall Project Area Existing Condition has Moderately Low Stability	No improvement	Improves to High Stability	Improves to Moderately High Stability	Improves to Moderately High Stability	Improves to High Stability

Cumulative Effects to Scenery

This cumulative effects analysis considers effects of past, present, and reasonably foreseeable future actions within the East Face Vegetation Management Project area. The geographic boundary for this cumulative effects analysis is the East Face project area and the viewsheds for the Elkhorn Drive Scenic Byway, Anthony Lakes Recreation Area, Ladd Canyon Forest Road 43 to Anthony Lakes Recreation Area, and North Wolf Creek Forest Road 4315. The temporal boundary is approximately 10 years, the amount of time needed for evidence of logging, restoration activities associated with road management and ecological function to soften and blend into the landscape more completely.

The effects of activities of past management activities in total have been combine and incorporated into the existing scenic integrity levels to maintain a range of levels from moderate and high in the designated viewsheds. Present and reasonably foreseeable future management are described in Appendix D of the EA. Appendix D contains an analysis of these activities to determine which activities overlap in time and space with the East Face project activities creating a measurable cumulative effect on scenery resources. These activities are discussed below.

In the scenic area of concern for the Elkhorn Drive Scenic Byway and the Ladd Canyon Forest Road 43 have the potential for cumulative effects from the Ladd Canyon/RMEF pre-commercial thinning project, the fuels reduction work in the Elkhorn Wildlife Area, fuels reduction work and timber harvest on the private lands adjacent to the project area, and the Limber Jim/Muir Fuels Reduction project. The Elkhorn Scenic Byway could be affected by the timber harvest and prescribed burning within the Elkhorn Wildlife Area (EWA) and the work being done on adjacent private lands. The Limber Jim/Muir and Ladd Canyon/RMEF project could affect scenery resources in the Ladd Canyon Forest Road 43 area.

The Ladd Canyon project is a precommercial thinning project, along the northern portion of the East Fact project area which could result in additional acres of reduced stocking levels promoting growth of desirable species, reduction of disease, insect outbreaks, and ladder fuels that increase fire intensity and the occurrence of crown fires. This would also result in a texture change to the existing highly established textured patterns in the dense forest stands resulting in a more varied pattern.

The EWA prescriptions would improve the scenic character by moving stands toward the historic range of variability. It would create more open stands of species compositions that are more fire resistant immediately adjacent to the treatments proposed in the East Face project and would improve the scenic stability. There is a potential the harvest activities could result in new skid trails, new or reconstructed roads, fresh tree stumps and slash, blackened tree boles, disturbance to the ground resulting from mechanical activity of cutting trees, and changes to the textured landscape pattern.

Overall, these projects (including the Limber Jim/Muir project) in combination with the East Face project would result in the reduction of fuels and thinning to enhance large tree growth would benefit long term scenic quality by providing a more stable, sustainable forest which is typical of vegetative character types found in the Elkhorn Mountains landscape character type. A sustainable forest would be promoted, the larger diameter trees (>20") would be retained and become more healthy as competition from other vegetation species would be reduced. The large trees would have more nutrients, water, and space for growing and would be visually enhanced for viewing along the travel routes. The landscape character will be scenically and ecologically improved as the vegetation patterns become more diverse as a more complex forest structure is established and old growth characteristics become more dominant.

Along the Elkhorn Scenic Byway OTEC Powerline fuel reduction work in combination with the East Face project have the potential to create some additional impacts to scenery resources in the foreground as this powerline is very visible at certain points along the 73 road. Effects would be similar to those described for vegetation management above. The additional fuels reduction work would improve protection of the powerline and reduce the potential for arcing in the event of a wildfire in the area.

There is a potential for firewood cutting to increase the number of stumps within the foreground of all of the scenic areas in addition to those stumps created by the East Face project. Firewood stumps may be more noticeable because they would not be cut as close to the ground within the scenic areas of concern.

Consistency Finding

All action alternatives would maintain a range of Moderate to High Landscape Character and Scenic Integrity (Condition) and would meet the established Visual Quality Objectives of Partial Retention or Retention. In areas designated to Partial Retention VQO the visitor would perceive a natural appearing to slightly altered landscape viewed in foreground or middleground and would have moderate scenic integrity. In areas designated to Retention VQO the visitor would perceive a natural appearing landscape viewed in foreground and would have high scenic integrity. The proposed treatments would be consistent with Forest Plan Standards and Guidelines for Visual Quality.

Required and Additional Disclosures

This section discloses the effects of the alternatives on the human environment as specified by law, regulation, policy, or Executive Order.

Conformance

The BLM portion of the East Face Vegetation Management Project EA it tiered to the Baker Resource Management Plan (RMP) and Record of Decision (ROD), which was approved July 12,

1989. This proposal has been reviewed to determine if it conforms with the Baker RMP/ROD, terms and conditions as required by 43 CFR 1610.5. This proposal has been found consistent with all applicable terms, conditions, standards, and guidelines specified in the Baker RMP/ROD.

Cultural Resources

No impacts to any known cultural resource site would result from implementation of any of the action alternatives. Appropriate protection and avoidance measures have been designed and applied to the known sites existing within the project area in conjunction with the project Archaeologist.

Tribal Treaty Rights

Treaties provide that Native Americans will continue to have the right to erect suitable buildings for fish curing, privileges of hunting, gathering roots and berries, and pasturing stock on unclaimed lands. Indian treaty rights and privileges were considered throughout this analysis and maintained through appropriate design and layout features, especially related to first food resources such as fish, wildlife, and riparian areas.

Many plants that can be found in eastern Oregon may have cultural significance, and some of the plants may be present in the East Face Project area. The following plants which may be of cultural significance may be found in environments similar to that of the East Face Project: Grouse whortleberry, Blue huckleberry, Russet buffaloberry, Bulrush, Blue elderberry, Scarlet elderberry, Geyer’s willow, Willow, Gooseberry/Currant, Alderleaf buckthorn, Yampah, Bolander’s yampah, Bitter cherry, Common chokecherry, Lodgepole pine, Mock orange, Gray’s biscuitroot, Fernleaf biscuitroot, Cous biscuitroot, Bitterroot, Ocean spray, Strawberry, Hawthorne, Lanceleaf springbeauty, Horsehair lichen, Balsamroot, Big sagebrush, and Saskatoon serviceberry. (It should be noted that no official survey was conducted by WWNF botanists for presence/absence of these plants in the project area.)

First foods are those individual resources, reserved in their Tribal treaties, to which Tribal members retained rights. These rights, such as hunting, fishing, and gathering roots and berries, have been acknowledged by the United States Supreme Court. The Tribes mission is to protect, restore, and enhance the first foods (including water, salmon, deer, cous, and huckleberry) for the perpetual cultural, economic, and sovereign benefit of the Tribe. They measure the success of resource management by the availability and utilization of these resources. The sustainability of these resources is considered by them the minimum ecological condition necessary to meet the trust responsibility of the United States.

All alternatives are relatively equal in their treatment of treaty rights and are expected to maintain treaty rights and opportunities into the future.

Biological Diversity

All existing native and desirable introduced species and communities are maintained with all alternatives. Erosion control measures (seeding) would use native species when possible (EA, Alternatives section). Biological diversity is not expected to be affected.

Public Safety

No long-term public safety problems are anticipated with any of the alternatives. Short-term safety hazards such as log truck traffic, helicopter yarding systems, and falling trees near roads would be mitigated through contract safety provisions and are not anticipated to impact public safety.

There is no expectation that there would be a change in public health and safety. Mitigation and precautions apply to the action alternative. Should a wildfire occur under any alternative, there could be an adverse impact to public health in terms of air quality and a change in the water quality. However, under Alternatives 2-5, safe firefighter ingress and egress would be improved and strategic areas from which to attack fires from would be created. No such improvement would occur under Alternative 1. Other safety measures are discussed in or are a standard part of sale contracts.

Standing trees that lean over or near roadways and present a hazard to public safety due to conditions such as deterioration or physical damage to roots, trunks, stems, or limbs would be removed from the project area.

There are no known effects on the human environment that are highly uncertain or involve unique or unknown risks. None of the actions threaten a violation of Federal, State, or local law. Action alternatives would comply with air and water quality regulations (laws). The effects on the quality of the human environment are not likely to be highly controversial based on public participation.

Research Natural Areas, Experimental Forests, and Wilderness

There are no research natural areas, experimental forests, or Wilderness areas within or immediately adjacent to the East Face project area. There are no known significant cumulative effects from the project and other projects implemented or planned on areas separated from the affected area of the project beyond those evaluated in Chapter IV of the FEIS of the Forest Plan. The physical and biological effects are limited to this analysis area. No actions are proposed which are considered precedent setting.

The only potential impacts on Wilderness areas from this project are from potential smoke incursion as discussed under Fire and Fuels section of this EA; however, any potential for smoke incursion from prescribed fire between July 4 and Labor Day would be restricted. Refer to the Lands with Wilderness Characteristics effects analysis in this chapter for a discussion of potential impacts to areas meeting wilderness criteria as defined by FSH 1909.12 Chapter 71.

Probable Adverse Environmental Effects that Cannot Be Avoided

Some impacts caused by implementation of management activities proposed in this analysis that cannot be avoided may be considered adverse according to individual interpretations. Stumps and disturbed areas are not a pleasing sight to some people, visually or environmentally. Truck traffic would compete with public traffic on roads used in common. Traffic and removal activities would also create dust and noise. Smoke from prescribed burning, fuels reduction, and slash disposal is an irritant and an unpleasant sight to some people. Recreation users may find changes to the areas they have visited in the past, either through reduced or increased access, changed landscape, or changes in vegetation.

Irreversible and Irretrievable Commitment of Resources

Irreversible resource commitments are actions that either deplete a non-renewable resource or disturb another resource to the point that it cannot be renewed within 100 years. There are no known significant irreversible resource commitments or irretrievable loss of timber production, wildlife habitats, soil production, or water quality from actions initiated under any of the alternatives. No heritage sites will be negatively affected.

Impacts to soil and water are controlled by management practices and mitigation measures and would not represent an irreversible resource commitment. For all practical purposes, rock is a non-renewable resource. Use of rock as surfacing represents an irretrievable commitment of a resource, although due to quantities of supply, it is not a significant commitment. Existing roads constitute a more-or-less permanent commitment of a portion of land to a purpose other than timber production.

Some non-designated old growth may be affected under the action alternatives, however, the affect is generally considered a positive one and there will be no net loss of old growth. In addition, some loss of snag habitat would occur under all action alternatives. It is not known whether this is an irretrievable or irreversible action at this time. It is also not known what impact this type of change may have on unidentified nest sites of management indicator species.

Energy Requirements of Alternatives

The need for less energy-efficient and more expensive harvest or fuel reduction techniques is often due to the need to mitigate visual concerns, soil damage or adverse effects on watershed and other resources that would occur if more energy-efficient means, such as tractor yarding systems were employed. In this analysis, a combination of yarding systems and road development scenarios were developed in order to evaluate the tradeoffs of implementing various options.

Prime Farmlands, Range Land, Forest Land

Actions taken under any of the alternatives would have no impact on farmland, rangeland, or forestland inside or outside the National Forest. There are no prime farmlands affected by the proposal. Wetlands and floodplains associated with streams and springs would be protected using mitigation guidelines previously identified. No designated Wild and Scenic rivers would be affected by this project proposal.

Civil Rights, Women, Minorities, Environmental Justice

There are no known direct or adverse effects on women, minority groups, or civil rights of individuals or groups. Action alternatives are governed by sale or service contracts, which contain nondiscrimination requirements to prevent adverse impacts to these groups. The no action alternative may have some short-term adverse impacts on the local community by not providing timber sale receipts. To the greatest extent possible all populations have been provided the opportunity to comment before decisions are rendered on proposals and activities affecting human health or the environment. The proposals within this EA would not have a direct or indirect negative effect on minority or low-income populations (Presidential Exec. Order No. 12898 on Environmental Justice).

Wetlands and Floodplains

Executive Order 11190 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands". The East Face Project is consistent with this EO because it does not propose to destroy or modify any wetlands. Executive Order (EO) 11988 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the occupation or modification of floodplains. The East Face Project is consistent with this EO because it does not propose to occupy or modify any floodplain.

Finding of No Significant Impact

As the responsible official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the CEQ Regulations (40 CFR 1508.13). I have reviewed and considered the EA and documentation included in the project record, and I have determined that the proposed action and alternatives will not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

Context

For the proposed action and alternatives the context of the environmental effects is based on the environmental analysis in this EA.

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis of this EA and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. My finding of no significant impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

1. Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

   Impacts that may be both beneficial and adverse are discussed in the Effects of Implementation section of the EA. These impacts are within the range of those identified in the Forest Plan. The actions will not have significant impacts on other resources identified and described in this analysis. The effect of the decision is non-significant in the long and short term.

2. The degree to which the proposed action affects public health or safety.

   Public health and safety will be minimally affected over a short term by the proposed project. Short-term safety hazards such as truck traffic, helicopters, and heavy equipment on and near roads will be mitigated through contract safety provisions (EA, pp. 287-288).

3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

   This project proposal does not affect any unique geographical characteristics such as parklands, prime farmlands, wild and scenic rivers, or ecologically critical areas (EA, pp. 140-146, 257-258, 287-289).

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

   Based on the analysis of the effects of implementing this project no substantial scientific evidence exists to dispute the size, nature, or effects of this project on any human environmental factors. (EA, Environmental Impacts section)

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

There are no known effects on the human environment that are highly uncertain or involve unique or unknown risks associated with this project. Fuels reduction, vegetation management, prescribed burning, and firewood cutting are common practices and the effects are well known. The EA effectively addresses and analyzes issues and environmental impacts associated with the project (EA, Environmental Impacts section).

These actions pose no disproportionately high or adverse human health or environmental effects, including social and economic effects, on minority or low-income populations. This project has shared in the federal government's overall trust responsibility to Indian tribes where treaty or other legally defined rights apply to National Forest System lands. Consultation has incorporated opportunities for tribal comments and contributions to the proposed action. Confederated Tribes of the Umatilla Indian Reservation (CTUIR) was provided copies of the proposed action and heritage reports. The CTUIR Board also received several general briefings on this project during formal consultation meetings in 2013, 2014, and in August 2015. Discussions with tribal archaeologists have been incorporated into project design. No other comments were received. (EA, pp. 257-258, 287)

6. The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.

   These actions do not set a precedent for other projects that may be implemented to meet the goals and objectives of the Wallowa-Whitman National Forest Land and Resource Management Plan. The Forest Plan, as amended has goals for providing wood products and protection of resources and municipal watersheds from wildfire. This project does propose site specific changes/amendments to the forest plan; however, they are specific only to the East Face project area due to the need to reduce fuels within specific strategic locations within and adjacent to the WUIs and private land interface specific to this project area. (EA, pp. 20, 26-28, 70-98, 104-106, Appendix D)

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

   There are no known significant adverse, cumulative, or secondary effects between this project and other projects (completed, active, or planned) adjacent to the affected area. Effects to the basic resource values of soil, water, vegetation, air, or fish and wildlife were estimated and determined to be localized and limited (EA, pp. 91-98, 98-122, 127-140, 146-153, 153-199, 209-224, 153-191, Appendix D). This determination is based on the results of cumulative effects analyses discussed in the EA that considered past, existing, and proposed activities.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

   Based on a cultural resource inventory and report, mitigation and protection measures, the known cultural, scientific, or historical resources within the project area have been protected during project design (EA, pp. 257-258, 287). Field studies have been completed for cultural and historic resources (Heritage Report, analysis file) on USFS lands and will be completed on BLM lands before implementation. The contract will contain a contract clause requiring protection of any newly detected sites. Consultation with potentially affected tribes and SHPO has been completed.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

A biological evaluation for wildlife proposed, endangered, threatened, and sensitive (PETS) species indicates that this project received a “no impact" determination for the “threatened” Canada Lynx, a beneficial impact to “sensitive” species Lewis’ woodpecker and White-headed woodpecker, and “May impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species for the following “sensitive” species: Rocky Mountain tailed frog, Columbia spotted frog, Northern bald eagle, North American wolverine, Gray wolf, Intermountain Sulphur, Western bumblebee, Fir pinwheel, Johnson’s hairstreak, and fringed myotis. (EA pp. 207-208, Wildlife Biological Evaluation, Analysis File)

The biological evaluation for fish species indicates that this project may affect likely to adversely affect bull trout and their designated critical habitat. NMFS concurred with this finding in their Letter of Concurrence (LOC), dated XXXXXX, 2015 and US Fish and Wildlife Services’ LOC dated XXXXXX, 2015 (Analysis File). No terms and conditions were provided.

Implementation of the East Face Project may impact redband trout individuals or habitat for this species, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. (EA p. 208)

The biological evaluation for PETS Plants indicates that project activities will have no impact on any threatened plants. There will be no impact to the sensitive species *Barbilophozia lycopoidiodes, Campylium stellatum, Helodium blandowii, Hydnotrya michaelis* and *Tomentypnum nitens*. These plants occur within pond edges or other wet areas where there will be no activities.

Botrychium species (*B.pedunculosum* and *B. montanum*) are known to occur within the East Face Vegetation Management project area. Additional locations for *Botrychium montanum* were discovered during botanical surveys for the East Face project. There will be no impact to sites from project activities.

There may be impacts to habitat (MIIH) or to the coniferous species *Pinus albicaulis*, however, the silviculture treatments for these stands are designed to restore and protect the species. It is anticipated that the treatments will be beneficial to the species in the long run by reducing potential for competition and vulnerability to insects. (EA pp. 204-207)

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The actions proposed in this project area focus on modifying fire behavior in strategic areas to provide for improved safe areas to firefighting resources, improved stand health, and wood products for surrounding communities. Analysis of the effects of implementing these actions do not threaten a violation of Federal, State, or local laws or requirements for protection of the environment. (EA, Environmental Impacts pp. 69-289)

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